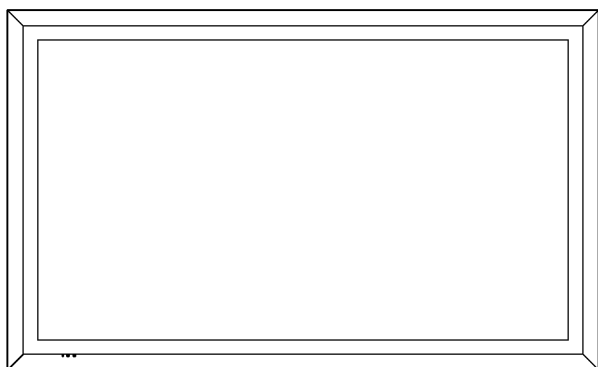


Service Manual

FULL HD LCD Display



Model No. TH-47LFT30W

Manufacturing ID No. and Destination

TH-47LFT30WU : North and Latin America

TH-47LFT30WA : Oceania

TH-47LFT30W : Other

WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by  in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

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1 Safety Precautions

1.1. General Guidelines

1. When conducting repairs and servicing, do not attempt to modify the equipment, its parts or its materials.
2. When wiring units (with cables, flexible cables or lead wires) are supplied as repair parts and only one wire or some of the wires have been broken or disconnected, do not attempt to repair or re-wire the units. Replace the entire wiring unit instead.
3. When conducting repairs and servicing, do not twist the Fasten connectors but plug them straight in or unplug them straight out.
4. When servicing, observe the original lead dress. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
5. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers shields are properly installed.
6. After servicing, make the following leakage current checks to prevent the customer from being exposed to shock hazards.

1.2. Touch-Current Check

1. Plug the AC cord directly into the AC outlet. Do not use an isolation transformer for this check.
2. Connect a measuring network for touch currents between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in Figure 1.
3. Use Leakage Current Tester (Simpson 228 or equivalent) to measure the potential across the measuring network.
4. Check each exposed metallic part, and measure the voltage at each point.
5. Reserve the AC plug in the AC outlet and repeat each of the above measure.
6. The potential at any point (TOUCH CURRENT) expressed as voltage U_1 and U_2 , does not exceed the following values:

For a. c.: $U_1 = 35 \text{ V}$ (peak) and $U_2 = 0.35 \text{ V}$ (peak);

For d. c.: $U_1 = 1.0 \text{ V}$,

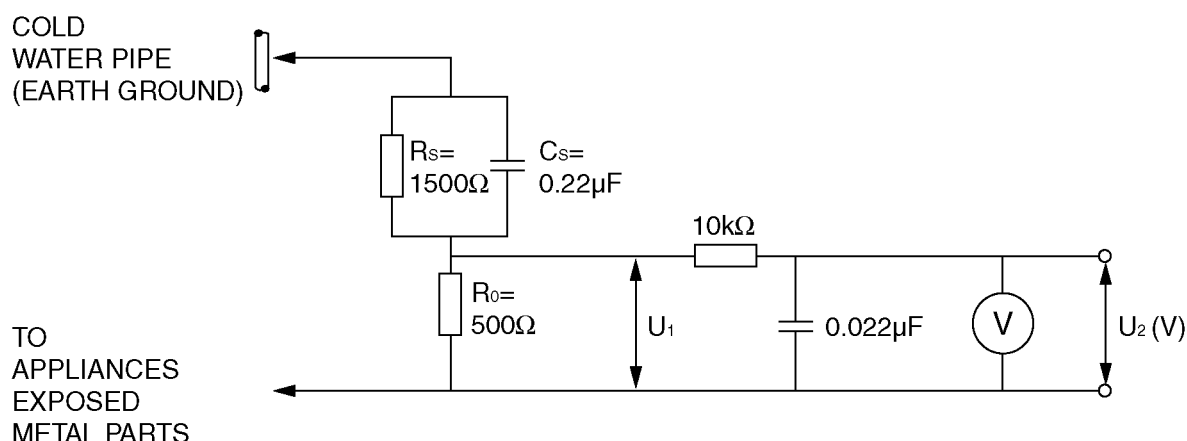
Note:

The limit value of $U_2 = 0.35 \text{ V}$ (peak) for a. c. and $U_1 = 1.0 \text{ V}$ for d. c. correspond to the values 0.7 mA (peak) a. c. and 2.0 mA d. c.

The limit value $U_1 = 35 \text{ V}$ (peak) for a. c. correspond to the value 70 mA (peak) a. c. for frequencies greater than 100 kHz .

7. In case a measurement is out of the limits specified, there is a possibility of a shock hazard, and the equipment should be repaired and rechecked before it is returned to the customer.

Measuring network for TOUCH CURRENTS



Resistance values in ohms (Ω)

V: Voltmeter or oscilloscope
(r.m.s. or peak reading)

Input resistance: $\geq 1 \text{ M}\Omega$

Input capacitance: $\leq 200 \text{ pF}$

Frequency range: 15 Hz to 1 MHz and d.c. respectively

NOTE - Appropriate measures should be taken to obtain the correct value in case of non-sinusoidal waveforms.

Figure 1

2 Warning

2.1. Prevention of Electrostatic Discharge (ESD) to Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor “chip” components. The following techniques should be used to help reduce the incidence of component damage caused by electrostatic discharge (ESD).

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any ESD on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging ESD wrist strap, which should be removed for potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static solder removal device. Some solder removal devices not classified as “anti-static (ESD protected)” can generate electrical charge sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

Caution

Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise ham less motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity (ESD) sufficient to damage an ES device).

2.2. About lead free solder (PbF)

Note: Lead is listed as (Pb) in the periodic table of elements.

In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder.

The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu).

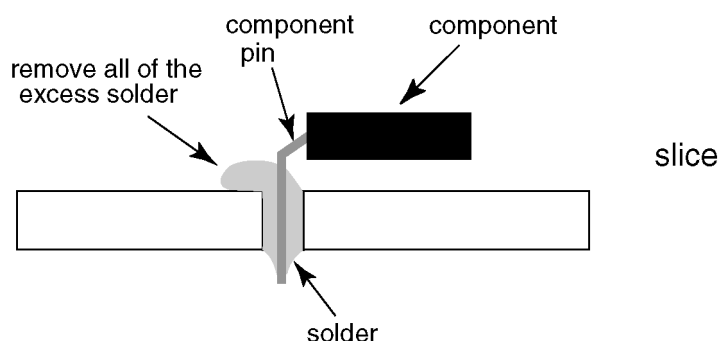
That is Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it's manufacture due to environmental conservation issues. For service and repair work, we'd suggest the use of Pb free solder as well, although Pb solder may be used.

PCBs manufactured using lead free solder will have the PbF within a leaf Symbol **PbF** stamped on the back of PCB.

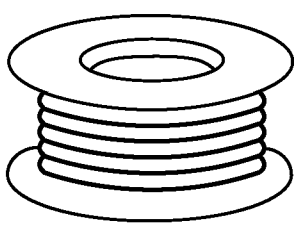
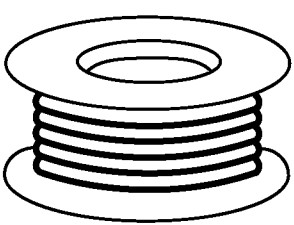
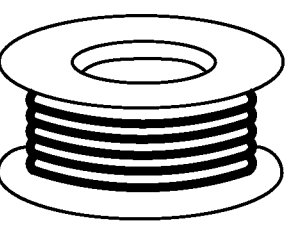
Caution

- Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30~40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).
- Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C).
If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If this is not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.
- After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side. (see figure below)



Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder can also be used.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g
		

2.3. Precautions for Installation

- Do not install by yourself. Please ask a installation professional or your dealer to install.
- This product corresponds to IP53^{*1} dust and water protection standard. Do not change or damage dust or water resistance of the product.
- Please note the dust and water resistance of this product does not guarantee damage or fault free.



CAUTION Using with dust or water resistance degraded causes fire, electric shock, or product damage.

This product corresponds to international standard IP rating (Ingress Protection) dust ingress protection level 5 and water ingress protection level 3.

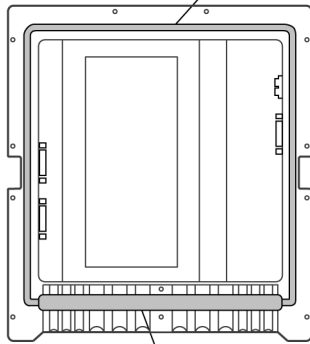
■ Terminal cover

After connecting cable etc. of the device to the terminals, check if the terminal cover is sealed correctly and closed firmly using all the fixing screws when attaching the terminal cover.

To seal the terminal cover correctly, be aware of the following points:

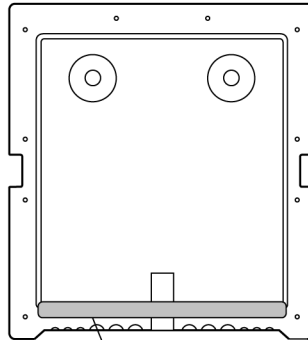
Check if the fixing sealant is fixed in the correct position in the cover. Fixing sealant is an important part to seal the cable part.

Terminal part on main unit rear side Fixing sealant



Fixing sealant

Terminal cover rear side

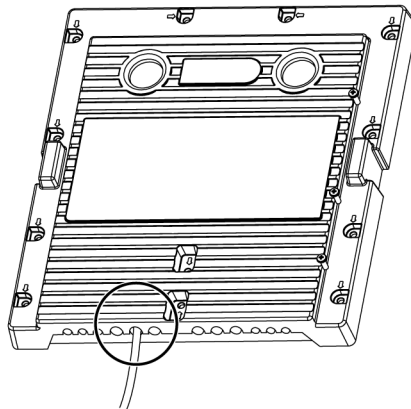
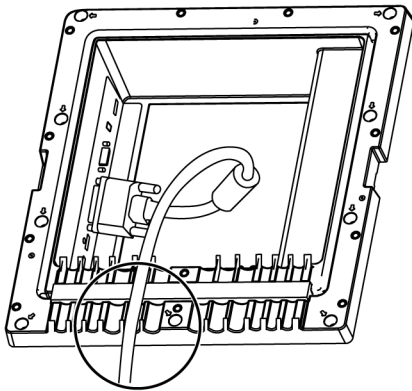


Fixing sealant

Note:

IPX3 water resistance refers to the capability to prevent the harmful effects of water falling as a droplet at any angle up to 60 degrees from the vertical.

Stick the cable to the shape of the dent on the terminal strip base tightly.



- The structure is to keep the airtightness by tucking the cable pulled out along the dent on the terminal strip base with both fixing sealant of the terminal strip base and terminal cover.

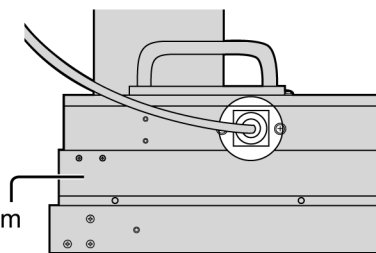
*1: Based on tests performed by Cosmos Corporation.

■ Power cable

To keep the waterproof property, do not loosen the part fixing the power cable to the main unit.

Do not force to bend the protruding part of the power cable. This may cause disconnection.

Main unit bottom

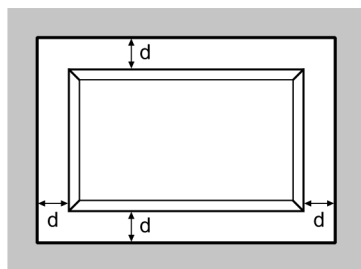


■ Protective coating

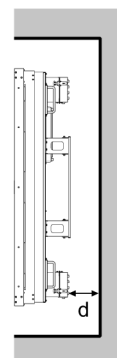
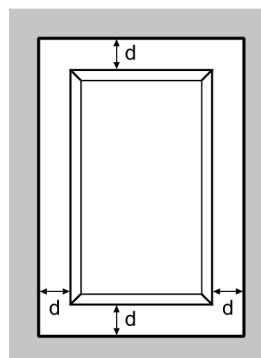
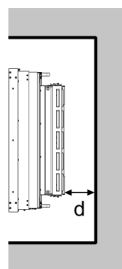
Cabinet aluminum parts and rear face are protected from corrosion with coating. Be careful not to damage the surface. In case the surface is damaged, corrosion may occur from there.

■ Installation position

- When direct sunlight is on the screen, black shadow may appear. This will disappear when the temperature drops.
- To install the product long term in a special environment such as near a swimming pool, hot spring, or ocean, or in a factory uses chemicals or gases, please consult your local Panasonic dealer beforehand.
- The product is equipped with cooling fans and air filters that need to be cleaned or replaced if covered with dust. Removing or installing air filters requires space around the Display. With this in mind, provide adequate space when installing the Display. [Height 7.874"/200 mm or greater, Width 7.874"/200 mm or greater, Depth 7.874"/200 mm or greater]



d: 7.874"/200 mm or greater



■ Installation conditions

To use the product in an environment where outdoor air temperature is lower than 39 °F (4 °C), make sure to set the "Winter Mode" to "On". The inside temperature is kept constant and the startup can be performed smoothly.

Do not exhibit or use this product in a condition where water splashes on to it continuously for long time.

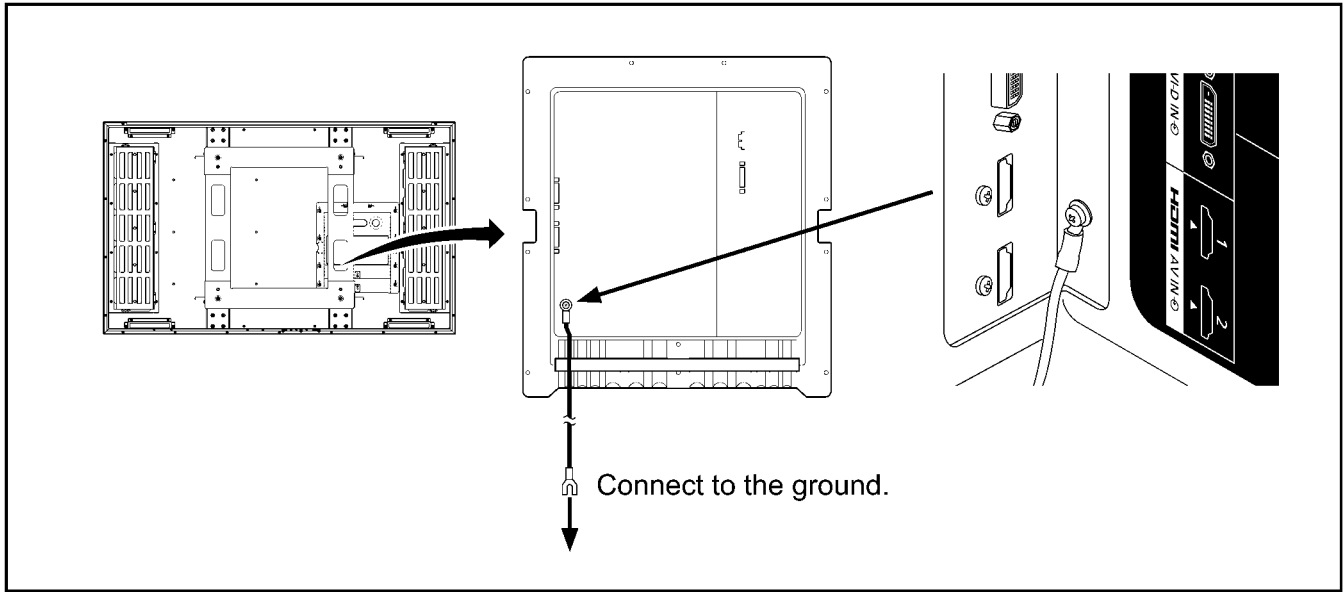
Always use the product at an ambient temperature in the range of 32 °F - 113 °F / 0 °C - 45 °C (during Winter Mode: -4 °F - 113 °F / -20 °C - 45 °C).

Use the product at ambient temperatures up to 104 °F/40 °C at an installation site where the display screen is exposed to sunlight.

■ To install on a wall etc.

- Consult your dealer about fittings etc. beforehand.
- Choose a permanent position where the total weight of the product and fittings can be hold permanently. If the strength of the position is not sufficient, a serious accident such as fall may be caused.
- Do not install the product where a person can be hang or lean on, or a passer may collide into. Accident may be caused.
- Take measures for tipping over and fall with an assumption of a fitting or installation location failure.
- Installation strength may be degraded due to aging depends on the environment. Ask a installation professional to inspect or repair regularly.
- When an abnormality or fault such as loose screw is detected, ask an installation professional or your dealer immediately for repair.
- Panasonic will not be responsible for any damages from an accident such as defect of installation, improper use, modification, or natural disaster.

■ Announcement (For W and WA models)



- For proper operation of touch panel, the ground wire has to be connected as shown figure.
- The ground wire is including in the accessories.
- Please ask service personnel for ground connection.

3 Service Navigation

3.1. Manufacturing ID No. and Destination

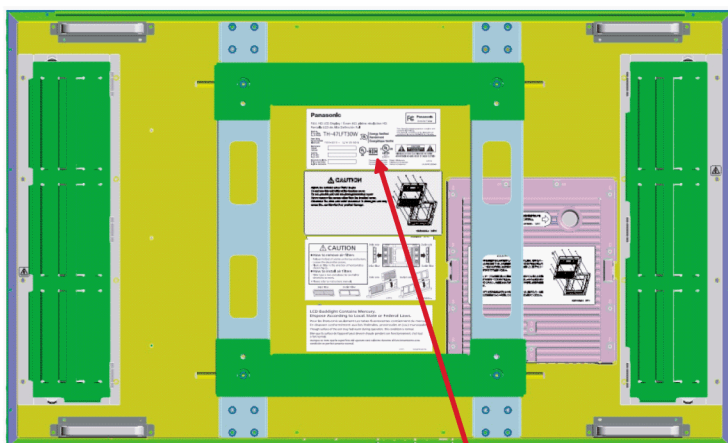
Destination can be confirmed by Manufacturing ID No. indicated in the Model Name Plate as following figure.

TH-47LFT30WU : North and Latin America

TH-47LFT30WA : Oceania

TH-47LFT30W : Other

The principal different points are AC power cord, Carton box, owners manual and set up guide.



Panasonic

FULL HD LCD Display

Полноэкранный ЖК-дисплей высокого разрешения
Полноэкранный РК-дисплей високої чіткості
Тынык анықтығы жоғары сұйық кристалдық дисплей

Model No.
N° de modèle
Model No. **TH-47LFT30W**

Manufactured

Serial No.
No. de serie
Серійний №
Серийный №
Серийный номер

Manufacturing ID No.
N° ID de fabrication

Panasonic Corporation
Панасонік Корпорейшн
Панасонік Корпорейшн
Панасонік Корпорейшн

Made in Indonesia
Произведено в Индонезии
Вироблено в Індонезії
Индонезияда жасалған

Power Rating
Астманың қуаты
Джерекінің қуаты
Қорек қуаты

220-240 V ~ 1.5 A 50/60 Hz
220-240 B ~ 1.5 A 50/60 Гц

BEAB Approved

CE

SAFETY

CAUTION : DO NOT REMOVE COVER. NO USER SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL ONLY.

VORSICHT : VOR ENTFERNEN DER RÜCKWAND STECKER AUS DER NETZSTECKDOSE ZIEHEN.

ATTENTION : RETIRER LA FICHE MÂLE DE LA PRISE DE COURANT AVANT D'ENLEVER LE PANNEAU ARRIERE.

ATTENZIONE : PRIMA DI TOGLIERE LO SCHERMALE, L'APPARECCHIO DEVE ESSERE STACCATO DALLA PRESA DI CORRENTE. QUESTO SCHERMALE DEVE ESSERE RIMOSSO SOLAMENTE DA TECNICI QUALIFICATI.

ATENCIÓN : NO ARRACAR SIN ANTES DESCONECTAR LA TENSION DE LA RED.

UWAGA! W ODSŁONIKU WYSTĘPUJE WYSOKIE NAPIĘCIE. PRZED ZDZIĘCIEM POKRYWY WYCIĄGNIĄC WTYCZKĘ Z GNIAZDA SIŁOWEGO.

FIGYELMEZ! NAGYFESZÜLTSÉGI ÁRÉSZÜLEK BUKKOLATÁNAK ELTÁVOLÍTÁSA ÉLETVESZÉLYES!

POZOR! V PRÍSTROJI JE VYSOKÉ NAPĚTÍ. PŘED ODEJMUTÍM KRYTY NUTNO VYJMOUT VÝHRAZET SILOVÉHO PRŮVODU ZE ZÁSOVKY.

POZOR! V PRÍSTROJI JE VYSOKÉ NAPĚTÍ. PŘED ODSTRANĚNÍM KRYTU JE POTŘEBNÉ VYTÁHNUT VÝHRAZET SILOVÉHO PRŮVODU.

ОСТОРОЖНО! НЕ СНИМАЙТЕ ЭТУ КРЫШКУ. ВНУТРИ НЕТ ЧАСТЕЙ, КОТОРЫЕ ОБОРУДОВАНЫ ПОЛЬЗОВАТЕЛЕМ. ПОРЧУ НЕ СЕРВИСНОЕ ОБСЛУЖИВАНИЕ ТОЛЬКО КВАЛИФИЦИРОВАННОМУ СЕРВИСНОМУ ПЕРСОНАЛУ.

УВАГА! НЕ ПОДКРИВЛЯЙТЕ ЦЮ КРИШКУ, ВПЕРЕДІ НЕМАЄ ЧАСТИН, ЩО ОБСЛУГОВУЮТЬСЯ КОРИСТУВАЧЕМ. ДОКУЧАЙТЕ СЕРВІСНЕ ОБСЛУГОВУВАННЯ ТІЛЬКИ КВАЛІФІКОВАНОМУ СЕРВІСНОМУ ПЕРСОНАЛУ.

АВАТОНАЭІІ СІТ КІІПІАКТАС АШТАНЭІІ.

UWAGA! PRZED ODCIĄNIĘCIEM KRYWY NUTNO WYCIĄGNIĄC WTYCZKĘ SIŁOWEGO PRZEWODU ZE ZASÓWKI.

ҚЫЗМЕТШІ ПЕРСОНАЛГА ТАЛҚЫСЫРЫҢЫЗ.

>PP< 1AA6P453989-A

3.2. Applicable signals

PC signals

*Mark: Applicable input signal

	Signal name	Horizontal frequency (kHz)	Vertical frequency (Hz)	PC IN (Dot clock (MHz))	DVI-D IN (Dot clock (MHz))	HDMI1 HDMI2
1	640x400@70Hz	31.46	70.07	* (25.17)	* (25.17)	
2	640x400@85Hz	37.86	85.08	* (31.5)	* (31.5)	
3	640x480@60Hz	31.43	59.88	* (25.15)	* (25.15)	
4	640x480@60Hz	31.47	59.94	* (25.18)	* (25.18)	*
5	640x480@67Hz	35.00	66.67	* (30.24)	* (30.24)	
6	640x480@72Hz	37.86	72.81	* (31.5)	* (31.5)	
7	640x480@75Hz	37.50	75.00	* (31.5)	* (31.5)	
8	640x480@85Hz	43.27	85.01	* (36.0)	* (36.0)	
9	720x400@70Hz	31.47	70.08	* (28.32)	* (28.32)	
10	800x600@55Hz	34.50	55.38	* (35.33)	* (35.33)	
11	800x600@56Hz	35.16	56.25	* (36.0)	* (36.0)	
12	800x600@60Hz	37.88	60.32	* (40.0)	* (40.0)	*
13	800x600@60Hz	38.00	60.51	* (40.13)	* (40.13)	
14	800x600@72Hz	48.08	72.19	* (50.0)	* (50.0)	
15	800x600@75Hz	46.88	75.00	* (49.5)	* (49.5)	
16	800x600@85Hz	53.67	85.06	* (56.25)	* (56.25)	
17	852x480@60Hz	31.47	59.94	* (33.54)	* (34.24)	
18	1,024x768@50Hz	39.55	50.00	* (51.89)	* (51.89)	
19	1,024x768@60Hz	48.36	60.00	* (65.0)	* (65.0)	*
20	1,024x768@60Hz	48.50	60.02	* (64.99)	* (65.18)	
21	1,024x768@70Hz	56.48	70.07	* (75.0)	* (75.0)	
22	1,024x768@75Hz	60.24	74.93	* (80.0)	* (80.0)	
23	1,024x768@75Hz	60.02	75.03	* (78.75)	* (78.75)	
24	1,024x768@75Hz	61.01	75.70	* (80.05)	* (81.0)	
25	1,024x768@85Hz	68.68	85.00	* (94.5)	* (94.5)	
26	1,024x768@120Hz	97.55	119.99	* (115.5)	* (115.5)	
27	1,066x600@60Hz	37.64	59.94	* (53.0)	* (53.0)	
28	1,152x864@60Hz	53.70	60.00	* (81.62)	* (81.62)	
29	1,152x864@75Hz	67.50	75.00	* (108.0)	* (108.0)	
30	1,152x900@65Hz	61.20	65.20	* (92.0)	* (92.0)	
31	1,152x900@66Hz	61.85	66.00	* (94.5)	* (94.5)	
32	1,152x900@75Hz	71.40	75.60	* (105.1)	* (105.1)	
33	1,280x768@60Hz	47.78	59.87	* (79.50)	* (79.50)	
34	1,280x800@50Hz	41.20	50.00	* (68.55)	* (68.55)	
35	1,280x960@60Hz	60.00	60.00	* (108.0)	* (108.0)	
36	1,280x960@85Hz	85.94	85.00	* (148.5)	* (148.5)	
37	1,280x1,024@50Hz	52.70	50.00	* (89.38)	* (89.38)	
38	1,280x1,024@60Hz	63.34	59.98	* (108.18)	* (108.18)	
39	1,280x1,024@60Hz	63.90	60.00	* (107.35)	* (107.35)	
40	1,280x1,024@60Hz	63.37	60.01	* (107.5)	* (107.5)	
41	1,280x1,024@60Hz	63.74	60.02	* (108.1)	* (108.1)	
42	1,280x1,024@60Hz	63.98	60.02	* (108.0)	* (108.0)	*
43	1,280x1,024@60Hz	63.79	60.18	* (108.19)	* (108.19)	
44	1,280x1,024@66Hz	70.66	66.47	* (119.84)	* (119.84)	
45	1,280x1,024@75Hz	79.98	75.02	* (135.0)	* (135.0)	
46	1,280x1,024@76Hz	81.13	76.11	* (135.0)	* (135.0)	
47	1,280x1,024@85Hz	91.15	85.02	* (157.5)	* (157.5)	
48	1,360x768@60Hz	47.71	60.02	* (85.5)	* (85.5)	
49	1,366x768@50Hz	39.55	50.00	* (69.92)	* (69.92)	
50	1,366x768@60Hz	48.36	60.00	* (86.71)	* (87.44)	
51	1,400x1,050@60Hz	65.12	59.91	* (121.38)	* (122.43)	
52	1,400x1,050@60Hz	65.32	59.98	* (121.75)	* (121.75)	
53	1,400x1,050@60Hz	65.35	60.12	* (121.81)	* (121.85)	
54	1,400x1,050@75Hz	82.28	74.87	* (156.0)	* (156.0)	
55	1,600x1,200@60Hz	75.00	60.00	* (162.0)	* (162.0)	
56	1,920x1,080@60Hz	67.50	60.00	* (148.5)	* (148.5)	
57	1,920x1,200@60Hz	74.04	59.95	* (154.0)	* (154.0)	
58	Macintosh13" (640x480)	35.00	66.67	* (30.24)	* (30.24)	
59	MacintoshLC13" (640x480)	34.97	66.60	* (31.33)	* (31.33)	
60	Macintosh16" (832x624)	49.72	74.55	* (57.28)	* (57.28)	
61	Macintosh19" (1,024x768)	60.24	75.08	* (80.0)	* (80.0)	
62	Macintosh21" (1,152x870)	68.68	75.06	* (100.0)	* (100.0)	
63	Macintosh II (1,280x1,024)	80.00	75.00	* (134.4)	* (135.2)	

Component signals***Mark: Applicable input signal**

	Signal name	Horizontal frequency (kHz)	Vertical frequency (Hz)	DVI-D IN (Dot clock (MHz))	HDMI1 HDMI2
1	525(480)/60i	15.73	59.94	* (27.0)	*
2	525(480)/60p	31.47	59.94	* (27.0)	*
3	625(575)/50i	15.63	50.00		
4	625(576)/50i	15.63	50.00	* (27.0)	*
5	625(575)/50p	31.25	50.00		*
6	625(576)/50p	31.25	50.00	* (27.0)	*
7	750(720)/60p	45.00	60.00	* (74.25)	*
8	750(720)/50p	37.50	50.00	* (74.25)	*
9	1,125(1,080)/60p	67.50	60.00	* (148.5)	*
10	1,125(1,080)/60i	33.75	60.00	* (74.25)	*
11	1,125(1,080)/50p	56.25	50.00	* (148.5)	*
12	1,125(1,080)/50i	28.13	50.00	* (74.25)	*
13	1,125(1,080)/24sF	27.00	48.00		
14	1,125(1,080)/30p	33.75	30.00	* (74.25)	*
15	1,125(1,080)/25p	28.13	25.00	* (74.25)	*
16	1,125(1,080)/24p	27.00	24.00	* (74.25)	*

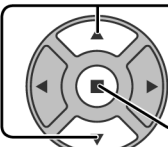
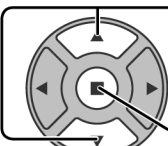
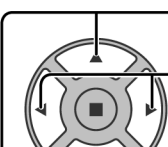
*1 Use the product at ambient temperatures below 104 °F/40 °C at an installation site where the liquid crystal panel is exposed to sunlight.

*2 Remote Control Transmitter is not water protection type.

Notes:

- Design and specifications are subject to change without notice. Mass and dimensions shown are approximate.
- This equipment complies with the EMC standards listed below.
EN55022, EN55024, EN61000-3-2, EN61000-3-3.

5 Operating Instructions

- 1  Press to display the Setup menu.
- 2  Press to select "OSD Language".
Press for more than 3 seconds.
- 3  Press to select "Options".
Press to display the Options menu.
- 4  Press to select your preferred menu.
Press to adjust the menu.
- 5  Press to exit from Options menu.

Options 1/2	
On screen display	On
Initial input	Off
Failover input	Off
Initial VOL level	Off 0
Maximum VOL level	Off 0
Input lock	Off
Button lock	Off
Remocon User level	Off

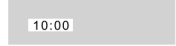
Options 2/2	
Off-timer function	Enable
Initial Power Mode	Normal
Power ON Screen Delay	Off
Clock Display	Off
Power On Message (No activity power off)	On
Winter Mode	Off
Power Switch Lock	Off

Normalisation

When both main unit buttons and remote control are disabled due to the "Button lock" or "Remocon User level" adjustments, set all the values "Off" so that all the buttons are enabled again.

Press the  button on main unit together with  button on the remote control and hold for more than 5 seconds. The "Shipping" menu is displayed and the lock is released when it disappears.

Item	Adjustments
On screen display	On: Displays all the following on screen. • Power on display • Input signal switch display • No signal display • Mute and the remaining time of off-timer after  was pressed. Off: Hides all the items above from view.
Initial input	Adjusts the input signal when the unit is turned on. Off ↔ PC ↔ DVI ↔ HDMI1 ↔ HDMI2 ↔ Off Notes: • Only the adjusted signal is displayed. • This menu is available only when "Input lock" is "Off".
Failover input	When there is no signal, the specified input is automatically switched to. Off ↔ PC ↔ DVI ↔ HDMI1 ↔ HDMI2 ↔ Off Notes: • When other than "Off" is set, "Input lock" will be grayed out and cannot be set. • When "Input lock" is set to other than "Off", this setting will be grayed out and cannot be set.
Initial VOL level	Press  button to adjust the volume when the unit is turned on. Off ↔ On Off: Sets normal volume. On: Sets your preferred volume. Notes: • When "Maximum VOL level" is "On", the volume can only be adjusted between 0 and your maximum range. • You can hear the changed volume regardless of your volume setting before opening the options menu if you adjust the volume when "Initial VOL level" is "On" and cursor is on the menu.
Maximum VOL level	Press  button to adjust the maximum volume. Off ↔ On Off: Sets auto maximum volume. On: Sets your preferred maximum volume. Notes: • If the "Maximum VOL level" is set lower than the "Initial VOL level", the "Initial VOL level" automatically becomes the same as the "Maximum VOL level". • The volume display can go up to 100 regardless of the settings. • You can hear the changed volume regardless of your volume setting before opening the options menu if you adjust the volume when "Maximum VOL level" is "On" and cursor is on the menu.

Item	Adjustments
Input lock	Locks the input switch operation. Off ↔ PC ↔ DVI ↔ HDMI1 ↔ HDMI2 ↔ Off Notes: - Only the adjusted signal is displayed. - Input switch can be used when this is set to "Off".
Button lock	Off ↔ On ↔ MENU&ENTER Off: All the buttons on main unit can be used. MENU&ENTER: Locks  and  buttons on main unit. On: Locks all the button on main unit. Sets Button lock with the unit buttons in the following procedure. Off: Press  four times → Press  four times → Press  four times → Press  MENU&ENTER: Press  four times → Press  four times → Press  four times → Press  On: Press  four times → Press  four times → Press  four times → Press 
Remocon User level	Off ↔ User1 ↔ User2 ↔ User3 Off: You can use all of the buttons on the remote control. User1: You can only use , , , , ,  buttons on the remote control. User2: You can only use  button on the remote control. User3: Locks all the buttons on remote control.
Off-timer function	Enable: Enables the "Off-timer function". Disable: Disables the "Off-timer function". Note: When "Disable" is set, the Off-timer is cancelled.
Initial Power Mode	Normal ↔ On ↔ Standby Sets the power mode of the unit for when the power recovers from failure or after plugging off and in again. Normal: Power returns in as the same state as before the power interruption. Standby: Power returns in standby mode. (Power Indicator : red/orange) On: Power returns in power On. (Power Indicator : green) Note: When using multiple displays, "Standby" is preferred to be set in order to reduce a power load.
Power ON Screen Delay	Off ↔ 1 ↔ 2 ↔ 3.... ↔ 30 You can set the power-on delay time of the displays to reduce the power load, when you press  to turn on the multiple displays that are set together, for example, on MULTI DISPLAY system. Set each display's setting individually. Off: The display will be turned on at the same time as  is pressed. 1 to 30 (sec.): Set the power-on delay time (second). After pressing , the display will be powered on with time delay depending on this setting. Notes: - During this function is working, the power indicator is blinking green. - This function also works when the power recovers from failure or after plugging off and in again the power cord.
Clock Display	Off: Not display the clock. On: Display the clock. The clock is displayed at the lower left of the screen when  button is pressed.  Note: When "PRESENT TIME Setup" is not set, the clock is not displayed even if "Clock Display" is "On".
Power On Message (No activity power off)	Whether to show/hide No activity power off Precautions at the time of power ON is set. On: The warning precautions are shown at the time of power ON. Off: The warning precautions are not shown at the time of power ON. Note: This setting is enabled only if "No activity power off" is "Enable".
Winter Mode	Set this function to maintain the image quality when the product is used in a low temperature environment of 39 °F/4 °C or lower. Off: Normal standby operation On: Image is muted at standby and backlight is turned on when the inside temperature of the display is 32 °F/0 °C or lower to prevent decreasing the temperature. Backlight is turned off when the inside temperature is 50 °F/10 °C or higher When this function is set to "On", the following message appears at standby.  Notes: - Do not unplug the power cable while using the product with this function "On". - When this function is set to "On", the power consumption at standby is approx. 110 W. - Turn this function "Off" to use this product in an environment of 39 °F/4 °C or higher. - The fans spin while this is set to "On" even if the Display is in standby mode.
Power Switch Lock	Sets the lock setting for the display Power switch. On: Power switch operation is disabled. Off: Power switch operation is enabled.

6 Service Mode

6.1. Service Menu Function (1)

Service Menu Display Method

There are 2 display methods.

Method 1

While pressing the "Volume -" button on the unit, press the RECALL button on the remote control 3 times.
(If the interval when pressing the RECALL button exceeds 1 second, then it is disabled.)

Method 2

- 1) Press the OFF TIMER button and then set the off timer.
- 2) Press the volume button and then set the volume to "0."
- 3) While the volume bar is being displayed, press and hold the screen display button for 3 seconds.

The service information is displayed.

Internal Temperature

The internal temperature of the product is displayed.

Power Error Information

- The number of times that a power error has occurred is displayed.
- If a power error is detected, the settings switch to stand-by status.
- If the power is turned on with the remote control and the power error is detected 3 consecutive times, as a consequence, power on cannot be performed with remote control.
- The power button on the monitor unit can be used for power on/off.
- When the power on cannot be performed with the remote control, if the AC cord is disconnected, it resets this status.

Panel Used Time

The elapsed time the LCD panel is used is displayed.

Temperature Error

- The number of times that a temperature error has occurred is displayed.
- If a temperature error is detected, the settings switch to stand-by status.
- Recovery from stand-by status can be performed with the power button on the remote control.

FAN Information

If internal fan has a trouble like stopped, "NG" is displayed.

Digital Power Management

The power management function can be set by using the operations on the DVI input screen.

Press and select with the buttons ▲/▼, and setting can be performed by pressing the buttons ◀/▶.

Off: The power management function does not work on the DVI input screen

On: The power management function works on the DVI input screen

Caution:

When setting to on, the energy star and DPMS standard cannot be achieved because the power consumption during stand-by status increases.

Filter test

The air filter test is automatically done at the time of use.

The check of an air filter test and a manual test are made.

The buttons ▲/▼ is pushed and chosen, and the buttons ◀/▶ can be pushed and set up.

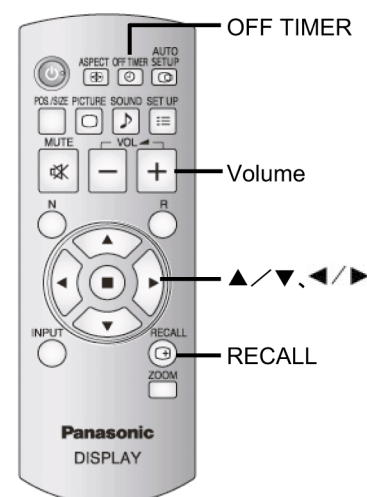
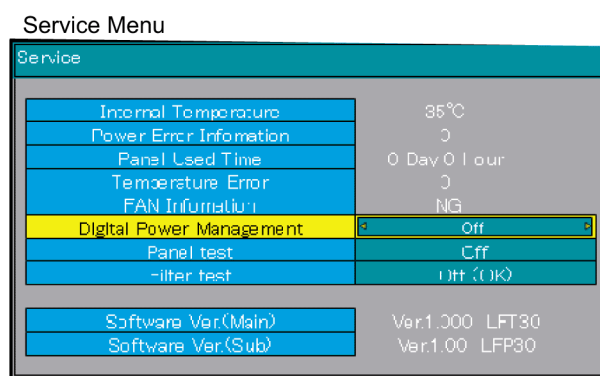
Off (OK) : Under a filter clog test stop (With no clog)

Off (NG) : Under a filter clog test stop (Clog)

On : Under a filter clog test

If On is used, the test of an air filter will be done.

When a result is Off (NG), there is a possibility of having accumulated and got dust clogged in the air filter.



6.2. Service Menu Function (2)

Special Menu

The product area can be set.

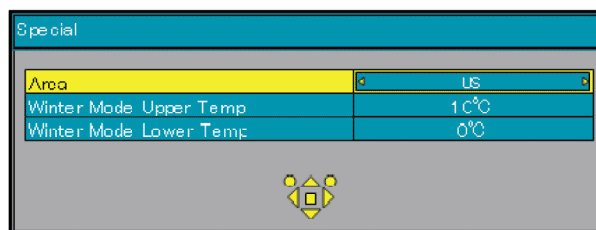
Special Menu Display Method

- 1) Display the service menu.
- 2) While pressing the monitor unit button "Volume -," press the "■" button on the remote control 3 times.

The "Special" menu is displayed.

(If the interval when pressing the "■" key exceeds 1 second, it is disabled)

Special Menu



Product Area Setting Method

Press the buttons ▲/▼ to select the "Area", and setting can be performed by pressing the buttons ◀/▶.

OFF: English (UK)

US: ENGLISH (US)

JP: Japanese

EU: English (UK)

ASIA: English (UK)

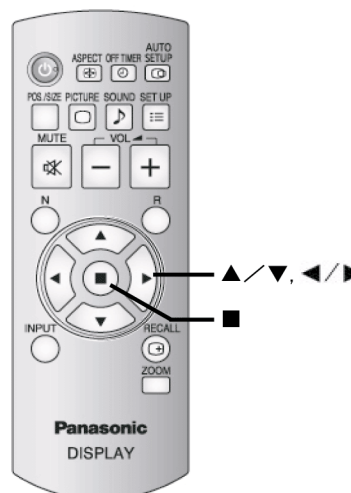
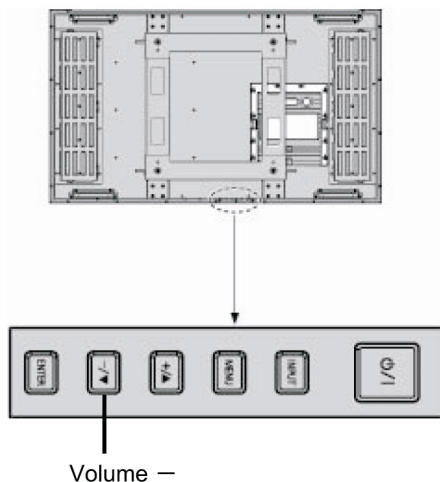
CN: Chinese

When set to the "US," the "Power Switch Lock" item on the "Options" menu displays, and the default value is set to "Off."

Upper and Lower Temperature Setting Method

Press the buttons ▲/▼ to select "Lower Temperature" or "Lower Temperature", and press ◀/▶ buttons to set the temperature.

(-100°C~100°C)



Start can be performed with the auto display mode on the LCD panel.

6.3. Service Mode Function (1)

White Balance Check

White balance check and adjustments can be performed.

Service Mode Display Method

- 1) Display the service menu.
- 2) Display the special menu.
- 3) Press and hold down the button "■" on the remote control for more than 5 seconds.

The "Service mode" menu is displayed.

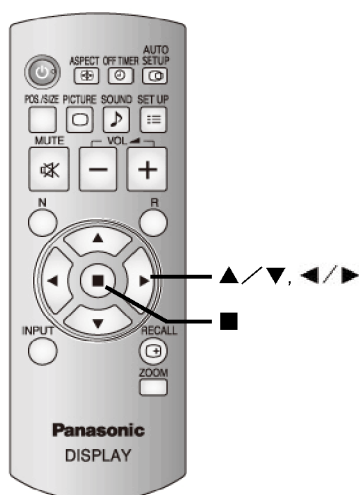
White Balance Adjustment Method

- 1) Press the buttons "▲/▼" on the remote control and select "Source."
- 2) Press the buttons "◀/▶" on the remote control and select "All."
- 3) Press the buttons "▲/▼" on the remote control and select "Properties."
- 4) Press the buttons "◀/▶" on the remote control and select "Red," "Green," or "Blue."
- 5) Press the buttons "▲/▼" on the remote control and select "Data."
- 6) Press the buttons "◀/▶" on the remote control and change the setting value.

White Balance Check Method

By setting the "Source" item to "All," and the "Properties" item to "White," the white balance adjustment value for "Red," "Green," and "Blue" can be referenced.

The elapsed time the LCD panel is used is displayed.



"Service Mode" menu

Service Mode	1.000 (M1)
	1.0.0
Source	All
Properties:	NormalRed
Data:	99

White Balance Adjustment

Service Mode	1.000 (M1)
	1.0.0
Source	All
Properties:	Red
Data:	85

White Balance Adjustment Check

Service Mode	1.000 (M1)	
	1.0.0	
Source	All	
Properties:	White	
Red 85	Green 85	Blue 85

Start can be performed with the auto display mode on the LCD panel.

6.4. Service Mode Function (2)

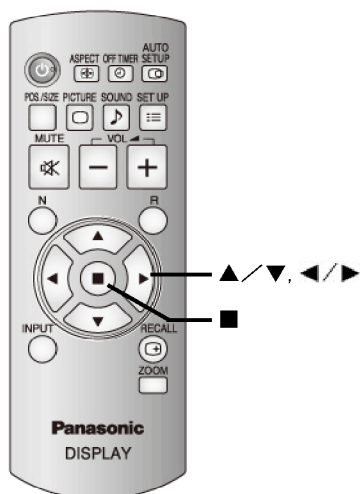
ADC Calibration Adjustment

An adjustment is performed when the LCD panel is replaced.

Adjustment Method

- 1) Display the "Service mode" menu.
- 2) Press the buttons "▲/▼" on the remote control and select "Source."
- 3) Press the buttons "◀/▶" on the remote control and select "All."
- 4) Press the buttons "▲/▼" on the remote control and select "Properties."
- 5) Press the buttons "◀/▶" on the remote control and select "ADC Calibration."
- 6) Press the buttons "▲/▼" on the remote control and select "Data."
- 7) By pressing the buttons "◀/▶" on the remote control, the auto adjustment starts.

Once the ADC Calibration adjustment starts, the item display for the "Data" item changes from "<<< >>>" to "ADC Calibration," and once the ADC Calibration adjustment is terminated, it returns to the "<<< >>>" display. The elapsed time the LCD panel is used is displayed.



"Service Mode" menu

Service Mode	1 000 (M1)
	1.0.0
Source	All
Properties:	NormalRec
Data	99

ADC Calibration Display

Service Mode	1 000 (M1)
	1.0.0
Source	All
Properties:	ADC Calibration
Data:	Not Yet

Before ADC Calibration

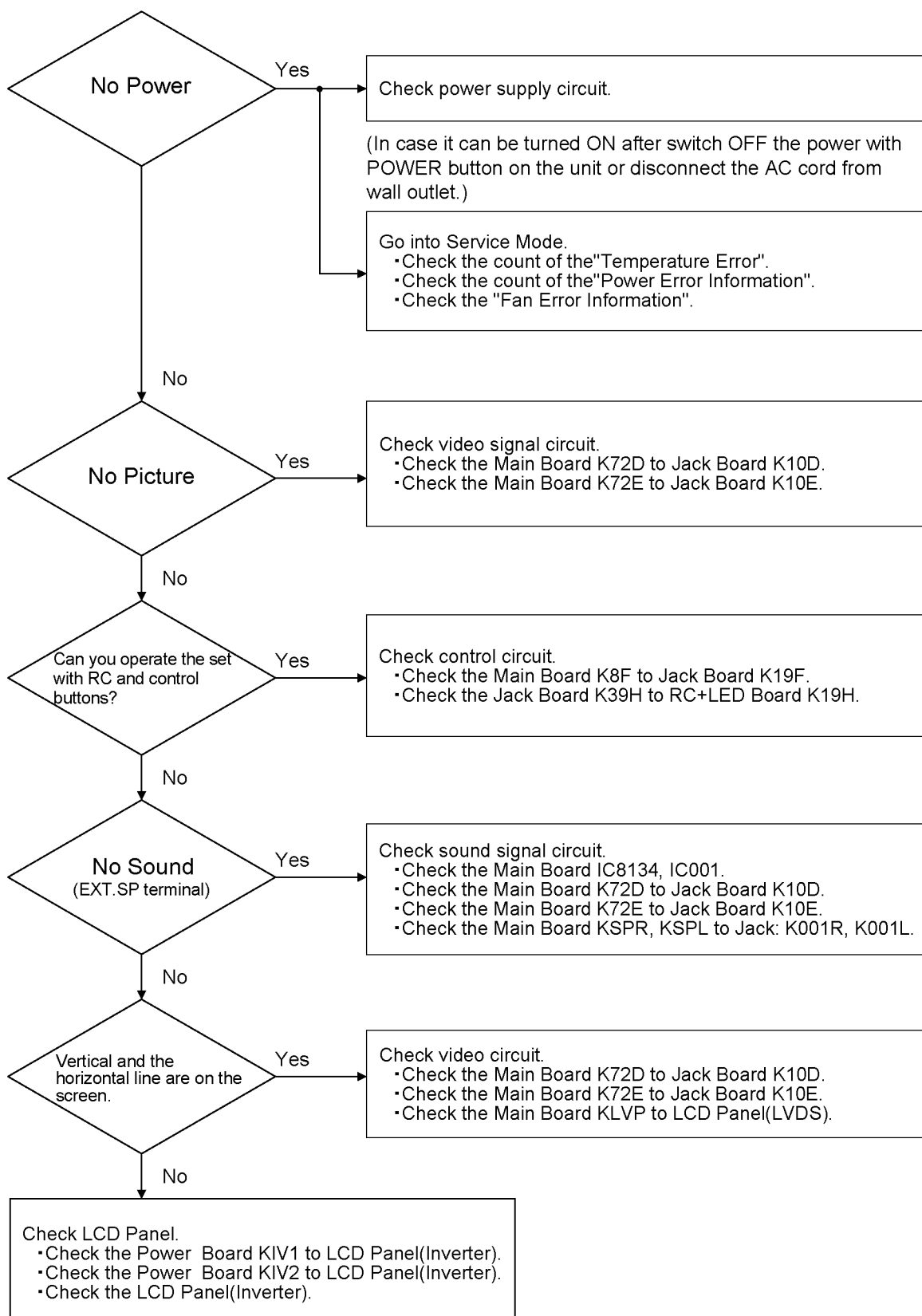
Service Mode	1 000 (M1)
	1.0.0
Source	All
Properties:	ADC Calibration
Data:	<<< >>>

During ADC Calibration

Service Mode	1 000 (M1)
	1.0.0
Source	All
Properties:	ADC Calibration
Data:	ADC Calibration

Start can be performed with the auto display mode on the LCD panel.

7 Troubleshooting Guide



8 Disassembly and Assembly Instructions

8.1. SERVICE INSTRUCTIONS

PRECAUTIONS

This unit is equipped with a liquid crystal display (LCD), and is designed to be dustproof and waterproof; therefore its cabinet is structurally airtight. If any parts (back plate, cabinet back, cabinet front, power cord outlet, etc.) except the AV covers, are disassembled, always carry out a test to ensure that the unit is airtight so as to be dustproof and waterproof after reassembly.

(Please refer to [9.2. secret inspection routine] for a procedure.)

■ Gaskets

Gaskets (cushioning gasket tape) are fitted to this unit to reduce electromagnetic interference (EMI) radiation. After replacing or repairing parts, take care to replace the gaskets exactly as they were before.

■ Disassembly Precaution

- The screws used in this unit may vary depending on their position and function. It is important that the correct screw is used in the correct place. Using the incorrect screw will result in damage to the unit.
- The type and number of nuts and bolts shown in drawings (photos) is subject to change. Check nuts and bolts on actual unit when servicing.
- Circuit arrangement shown in drawings (photos) may differ to end products. Check circuit arrangement on the actual unit when servicing. After servicing, always leave the circuit arranged as it was before.

Special Tools and Equipments

1. Torque Wrench

For fastening the waterproof nut placed a hole at rear cover for AC cord

Nut Size: 36.2 mm

Tightening torque: 50 kgf · cm

Refer to Chapter 8.23 and 8.24

2. Air tightness test jig, tools and equipment

Purpose: To compliant with IP66 dustproof and water resistant protection, Air tightness test is required after disassemble.

Outline: Decrease air pressure inside of the unit and confirm the differential pressure by Manometer after fixed period.

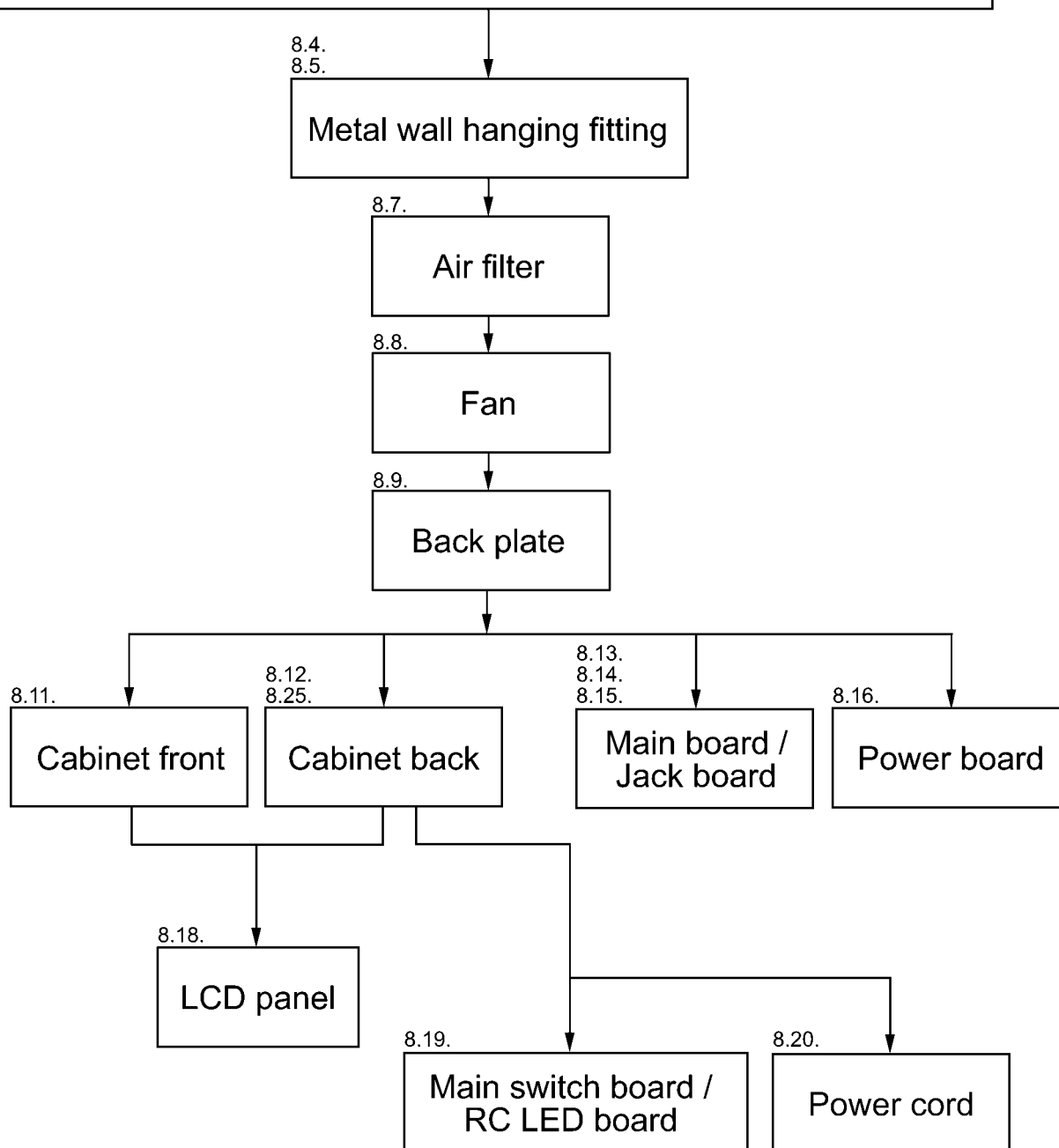
Equipment: Manometer, Air tube, Pump / Compressor, Joint, etc.

8.2. Disassembly Procedure Chart

- The following chart shows which components to remove to detach parts for replacement.
- Follow this chart to disassemble the unit to replace parts efficiently.

Preparation

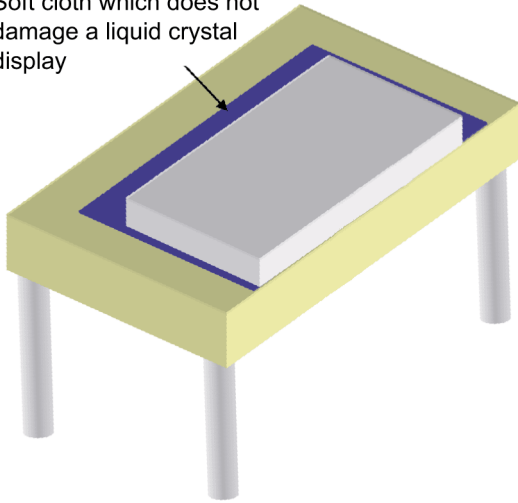
1. Turn off the power switch and remove the power plug from the wall socket.
2. Remove any other connected devices.
3. Lay the main unit front down on soft fabric trying not to damage the liquid crystal screen.



8.3. Preparation

Please pull soft cloth etc. not to damage a screen and please turn the front of a main part down and lay it down.

Soft cloth which does not damage a liquid crystal display

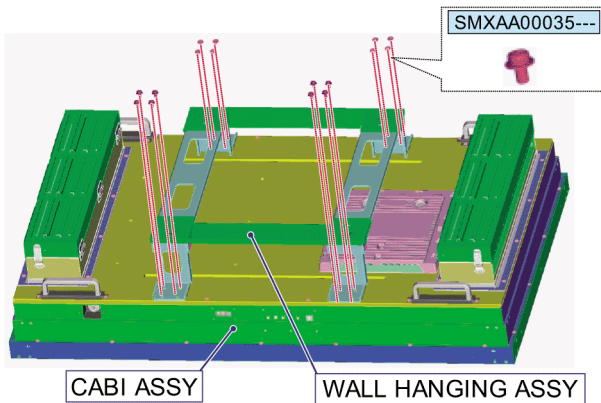


The cautions at the time of each module exchange

- When you exchange each module, please be sure to carry out according to the following procedure.
- When you attach each module, please do not bolt a screw strongly.

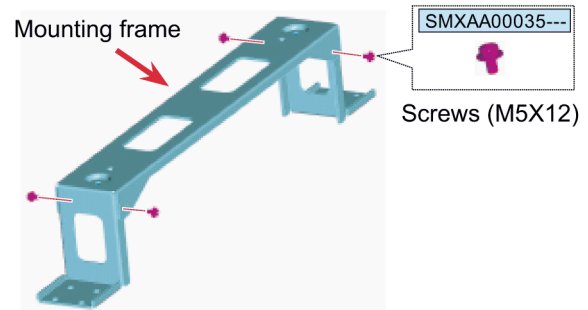
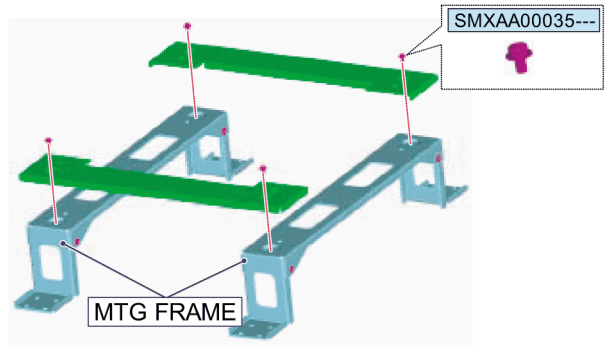
8.4. Removing the metal wall hanging fittings

Undo sixteen screws (SPECIAL SCREW 5X12) to remove the metal wall hanging fittings.



8.5. Disassembling the metal wall hanging fittings

1. Undo four screws (SPECIAL SCREW 5X12) to remove the metal wall hanging fittings.
2. When replacing the mounting frame, put four screws (SPECIAL SCREW 5X12) in place.



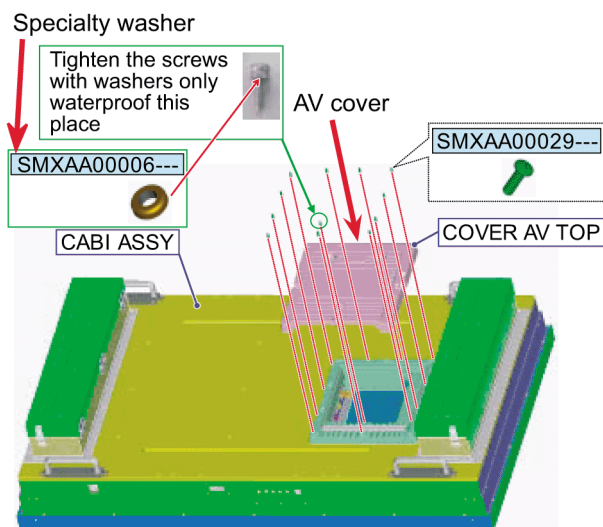
8.6. Removing the AV covers

1. Undo the twelve screws to remove the AV cover from the back plate. (SPECIAL SCREW 4X12)
2. Remove the AV cover and fit the replacement AV cover.

Precautions for removing and fitting the AV cover

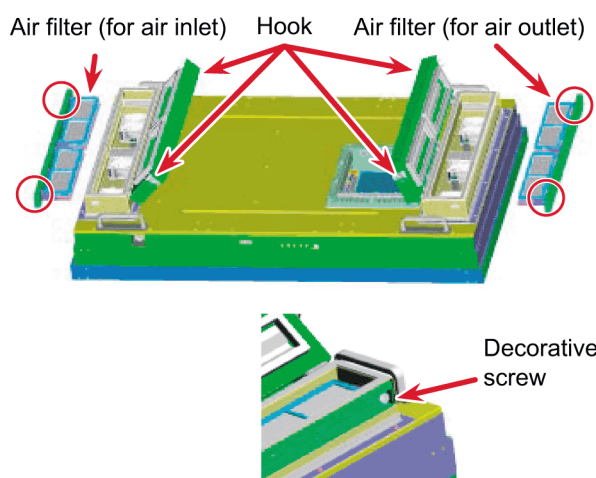
- A specialty washer is fitted in one place on the AV cover to ensure dustproof and waterproof performance. When fitting the AV cover, always put the specialty washer on the screw facing the correct direction (rubber side facing the AV cover).
- When removing the AV cover, undo all 12 screws in order from the bottom up to prevent the AV cover from slipping off. Beware of opening the AV cover with any screws left on as this will damage the AV cover.

- The replacement AV cover is a single unit part including the warning label and gel for the wire outlet.



8.7. Removing the air filters

1. Remove the two hooks fixed on the top and bottom of one side to open the filter cover.
2. Undo the two decorative screws fixed on the side, and remove the air filter together with the holder to horizontally.



Precautions for replacing the air filters

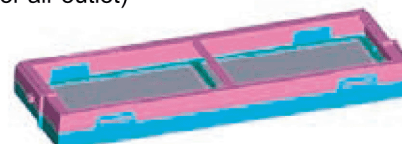
- The air filter functions for the inlet and outlet of air differ greatly. If they are fitted incorrectly, they can allow dust to enter the main display unit. Always fit them correctly.
 - Remove the air filters in a horizontal direction according to the procedure described above.
- Forcibly opening the filter cover to remove it will result in damage to the unit.

- Cleaning air filters is required, because dust and dirt builds up in air filters during use.
- Clean any dust and dirt adhering to the air filters, and around the unit, using a vacuum cleaner. Take care not to damage the air filters while cleaning them.

Air filter (for air inlet)



Air filter (for air outlet)



8.8. Removing the air supply fan and exhaust fan.

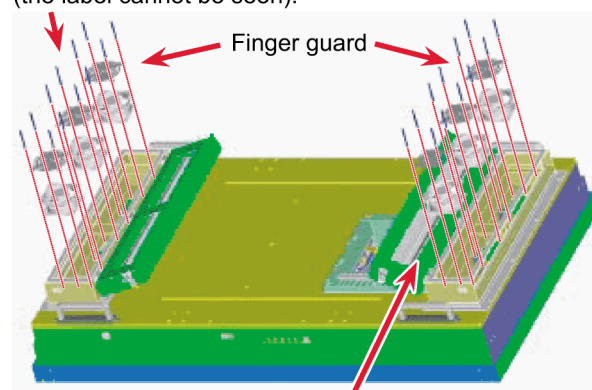
1. Remove the screws which hold the finger guard and fan together. (SCR PAN+SW+W 4X50, 4 screws per part, 6 parts)
2. Remove the coupler of the fan.
3. Remove the fan and finger guard.

Precautions for replacing the fan

The air inlet fan and air outlet fan face different directions when fitting them. If they are placed incorrectly, they will not perform their functions of moving air in or out. Always place them correctly.

Air inlet fan

The label on fan faces down (the label cannot be seen).



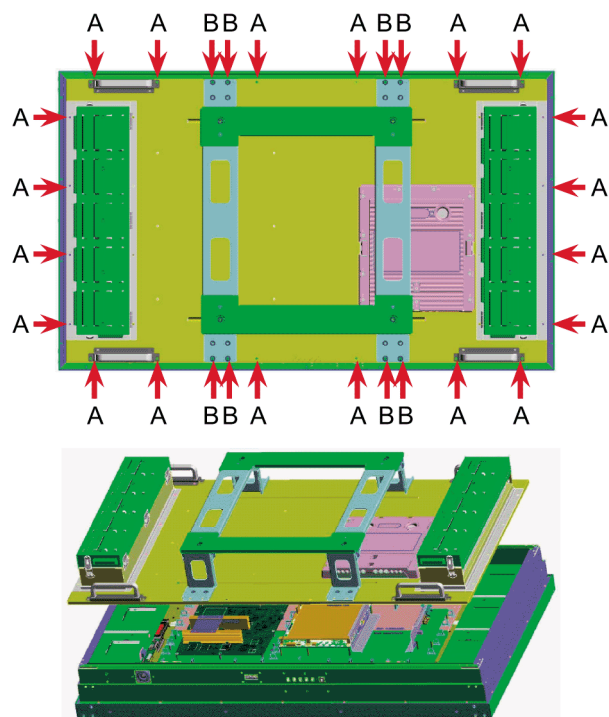
Air outlet fan

The label of fan faces up (the label can be seen).

8.9. Removing the back plate

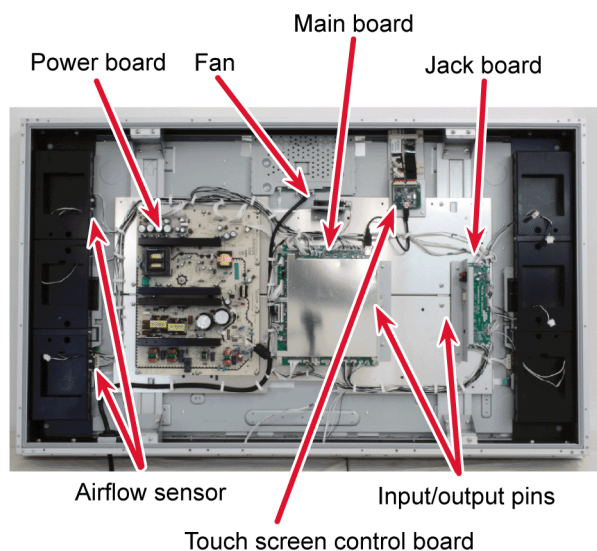
1. Remove the fan. Remove the coupler for the fan and temperature sensor, and tuck the cable into the hole that the fan has been removed from.

- Undo the screws shown in the drawing, which hold the back plate.
 - A: SPECIAL SCREW 4X12, 20
 - B: SPECIAL SCREW 5X12, 8
- Lift the handle to remove the back plate.



8.10. Arrangement of the board

Remove the back plate to check the board.

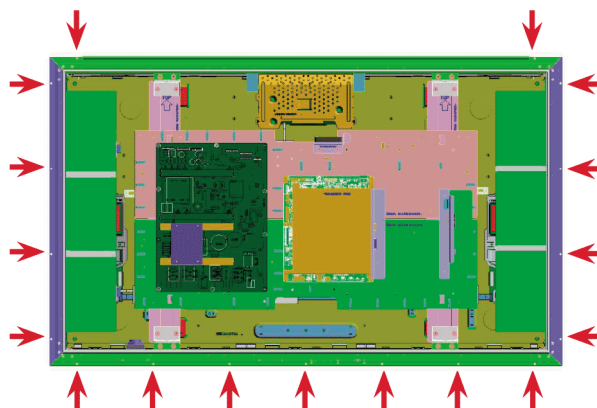


8.11. Removing the cabinet front (including the touch screen)

About cabinet front (touch panel is included) exchange

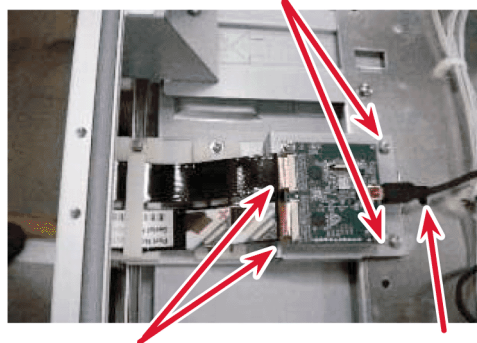
- After exchanging a cabinet front (a touch panel is included), a setup of a touch panel is required. Please refer to [9.1. a setup of a touch panel] for the setting method.

- Remove 17 screws which hold the cabinet front and cabinet back together. (SPECIAL SCREW 4X12)

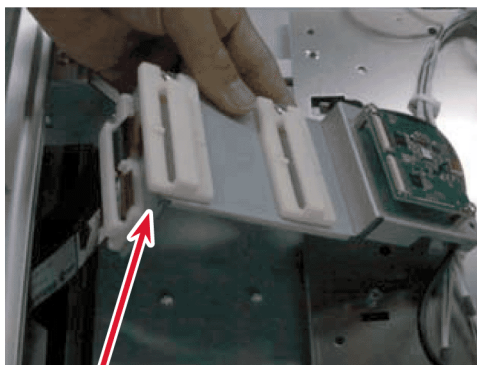


- Remove the touch screen control board holder. Remove two screws which secure the holder. (SCR BIN+SW+W 3X6)
- Remove the FFC cable and USB cable from the touch screen control board.

Undo the screws

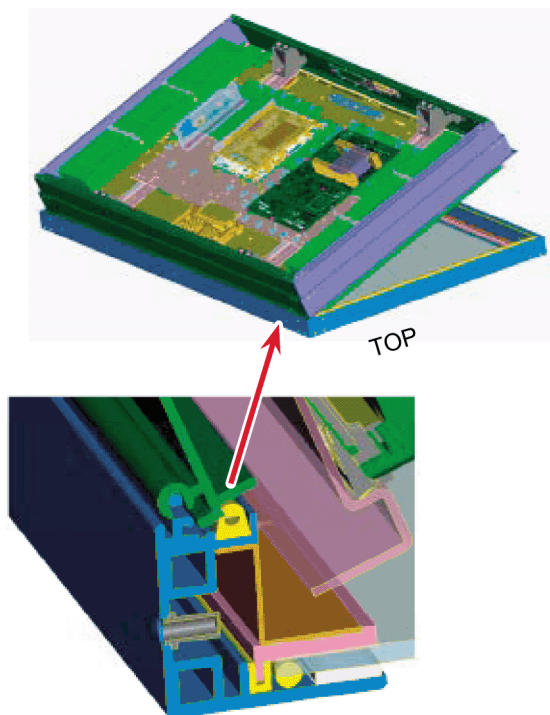


Remove the FFC cable. Remove the USB cable.



Pull out the FFC cable.

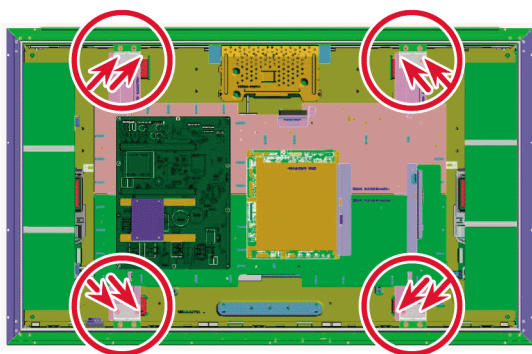
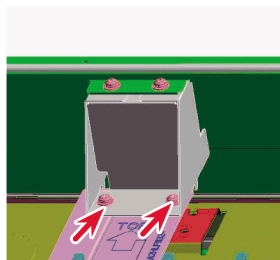
4. The top part of the cabinet front and cabinet back are made like a hinge. Lift the bottom of the cabinet (on the same side as the main unit control button), then lift the entire unit to remove the cabinet back, together with the LCD panel, from the cabinet front.



* The cabinet front is supplied as a single unit part which includes the touch screen.

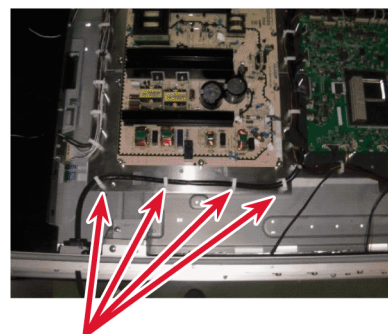
8.12. Removing the cabinet back

1. Undo eight screws in the metal panel mounting brackets. (SCR BIN+SW+W 4X6)

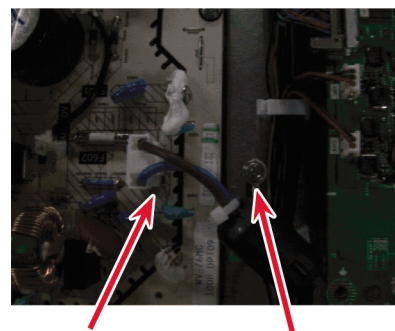


2. Take the following steps to prepare for removing the cabinet back together with the power cord, because the power cord is fitted to the cabinet back.
- Remove the power cord from the clamp which holds the cords.

- Pull out the coupler K601 for the power board.
- Undo the screws holding the earthed wire.
- Cut the CV band which ties them together.

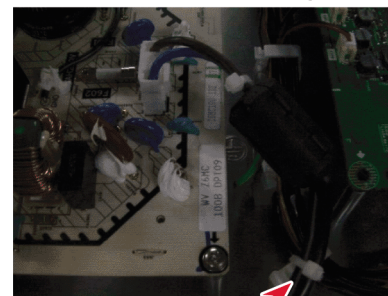


Remove the cord from the clamp.



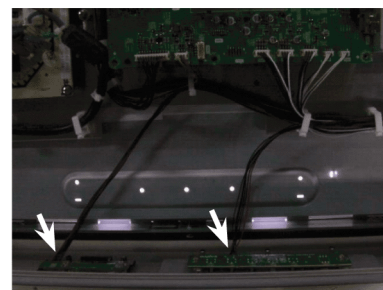
Keep holding the lock tab to pull out the connector.

Undo the screws holding the earth.

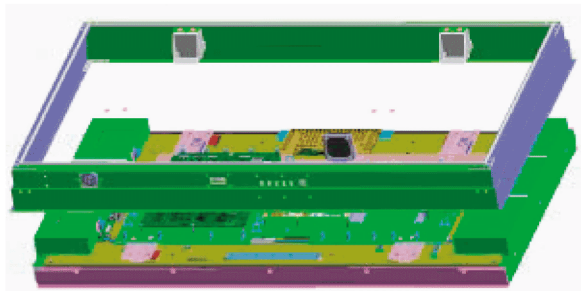


Cut the CV band
* Take care not to damage the cord.

3. Remove the couplers for the main switch board and the RC LED board which are fitted on the cabinet back.

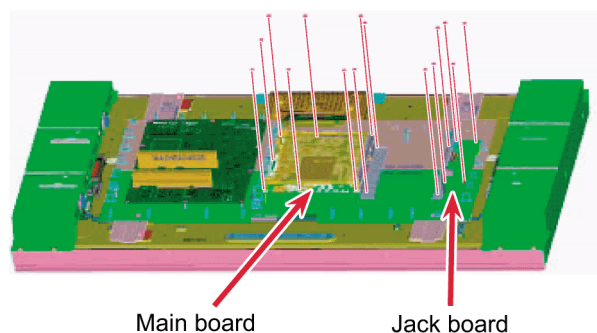


4. Lift the cabinet back, keeping it horizontal to remove it.



8.13. Removing the main board and jack board.

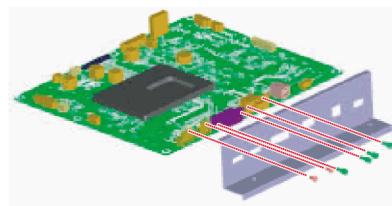
1. Remove nine screws which hold the protective cover of the main board, main board, and metal pin fittings together. (SCR PAN+SW+W 3X6)
2. Detach the coupler which is connected to the main board, then gently remove the main board.
Coupler located inside the main board: K8F, K72D, K72E, KTH2, KTH1, KWIND2, KWIND1, K18A, KFN2, KFN3, KFN4, KSUB2, KTH3, KTH4, KFN5, KFN6, KFN7, KFN1, K16C, KSPR, KSPL, KLVP, K16B, K16A
3. Remove six screws which hold the jack board and metal pin fitting together. (SCR PAN+SW+W 3X6)
4. Detach the coupler which is connected to the jack board, then gently remove the jack board.
Coupler located inside the jack board: K39G, K19F, K10E, K10D, K39H, K001R, K001L



8.14. How to replace the main board

1. Remove the screws which hold the metal fitting on the pin.
 - a. Hexagonal nut X 4: DVI IN pin, PC IN pin (SPECIAL SCREW)
 - b. X 2: HDMI pin (SCR PAN 3X8)

2. Replace the main board with the replacement board.

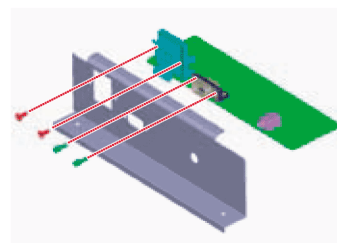


Precautions for removing and fitting the main board

Aluminium tape is affixed on the main board USB pin and metal pin fitting. Make sure that this aluminium tape remains in place while handling them. (25X10mm: 1 sheet)

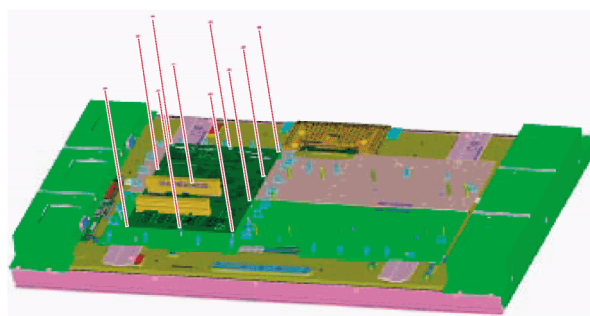
8.15. How to replace the jack board

1. Remove the screws which hold the metal fitting on the pin.
 - a. Hexagonal nut X 2: SERIAL pin (SPECIAL SCREW)
 - b. X 2: EXT SP pin (SCR TPG BRZ 3X8)
2. Replace the jack board with the replacement board.



8.16. How to replace the power board

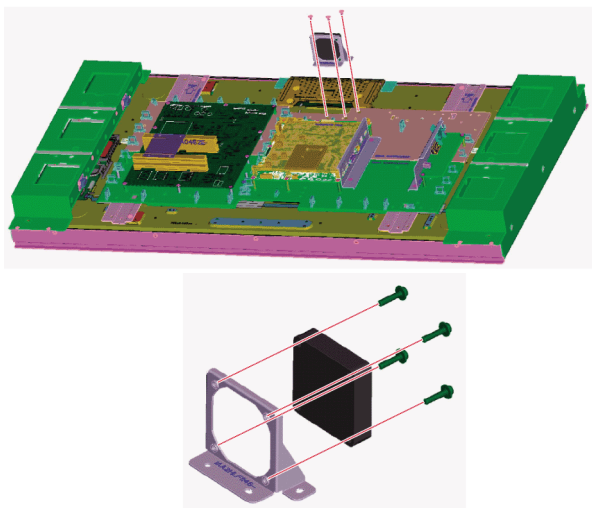
1. Detach the coupler which is connected to the power board.
Coupler located inside the power board: KIN2, KIN1, K6C, K6B, K8A, K6A, K600
2. Undo 10 screws which hold the power board. (SCR BIN+SW+W 3X6)
3. Gently remove the power board and replace it with the replacement board. (Fuses are fitted on the replacement board)



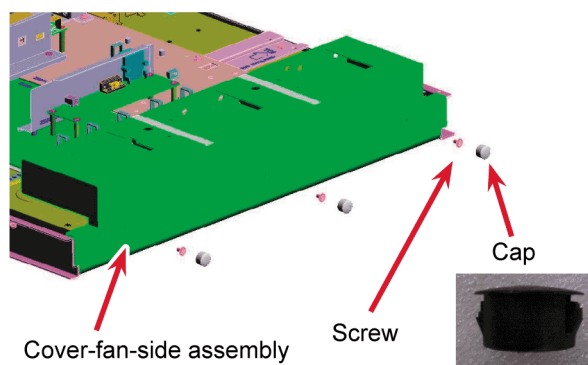
8.17. How to replace the fan

1. Detach the coupler KFN1 which is connected to the main board.
2. Undo three screws which secure the fan holder. (SCR BIN+SW+W 4X10)

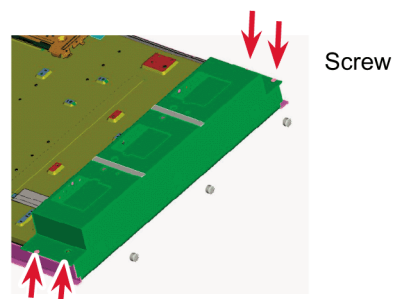
3. Remove four screws which secure the fan holder and detach the fan, then replace with the replacement fan. (SCR BIN+SW+W 4X20)



4. Remove six screws (three on each side) which hold the cover-fan-side assembly from the side. (SCR BIN+SW+W 4X10)



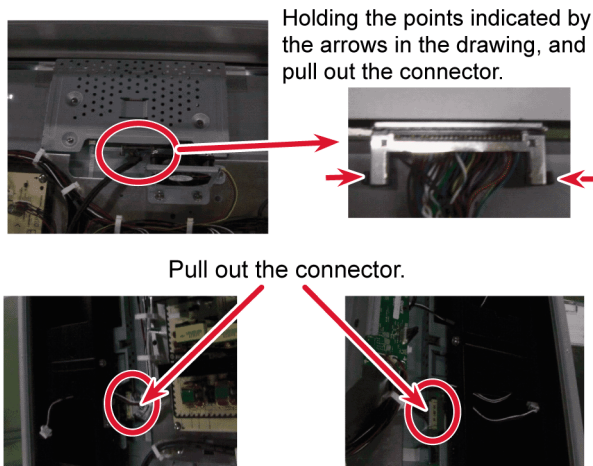
5. Remove eight screws (four on each side) which hold the cover-fan-side assembly from the top. (SCR BIN+SW+W 4X10)



8.18. How to replace the LCD panel

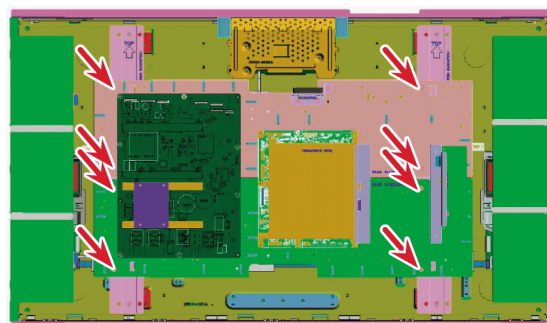
Carry out the following steps to remove the parts attached to the LCD panel.

1. Remove the coupler for LVDS cable from the T-CON unit of the LCD panel.
2. Remove the coupler for the cable from the inverter unit of the LCD panel (two places).

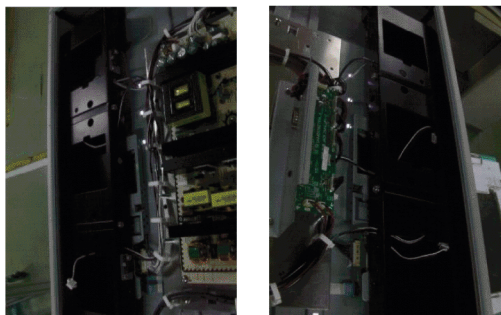
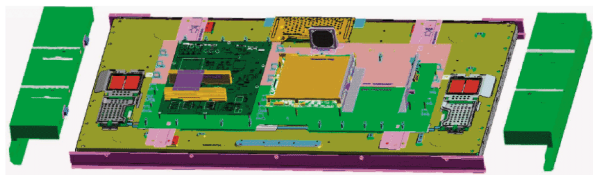


3. Remove the cap from the side of the cover-fan-side assembly. The cap is fixed with two tabs. (three on each side, total of six)

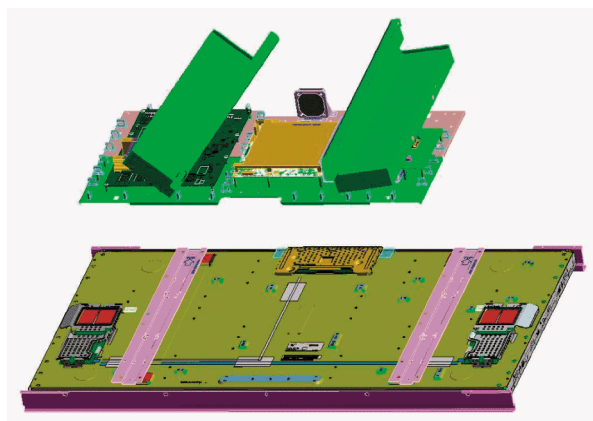
6. Undo eight screws which fix the metal fittings A and B of the chassis base. (SCR BIN+SW+W 4X10)



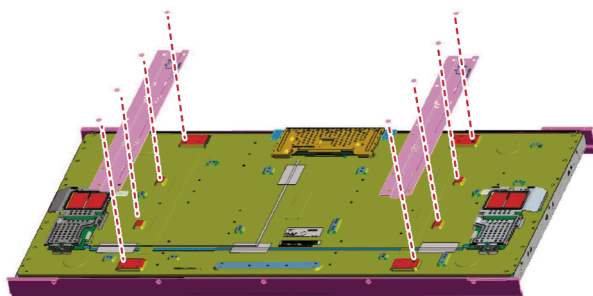
7. Slide the cover-fan-side assembly to the sideways to remove it. There are cables as shown in the photo. Take care not to cut them while removing the cover-fan-side assembly.



8. Remove the cover-fan-side assembly and the metal fittings A and B for the chassis base, from the LCD panel.

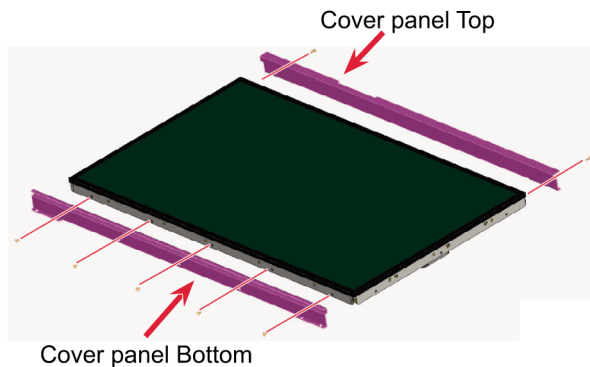


9. Undo eight screws to remove two metal panel holder fittings. (SCR BIN+SW+W 4X6)



10. Undo two screws to remove the cover panel Top. (SPECIAL SCREW 4X12)

11. Undo five screws to remove the cover panel Bottom. (SCR BIN+SW+W 4X10)



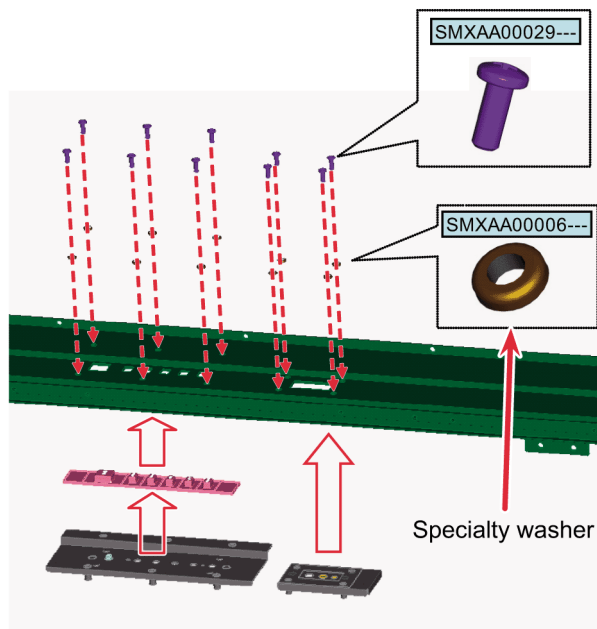
12. Replace it with the replacement LCD panel assembly.

8.19. How to replace the main switch board and RC LED board.

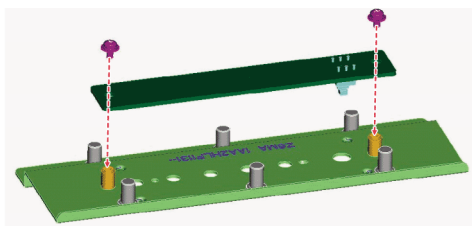
1. Remove ten screws from the bottom of the cabinet back, and remove the control button, main switch board, and RC LED board together with the metal holder fitting. (SPECIAL SCREW 4X12)

Precautions for removing and fitting the main switch board and RC LED board.

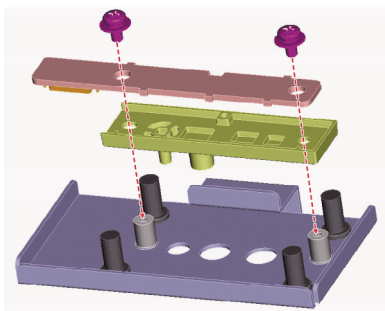
Ten specialty washers for ensuring dustproof and waterproof performance are fitted on ten screws. When fitting the main switch board and RC LED board, always put the ten specialty washers on the screws facing the correct direction (rubber side facing the cabinet back).



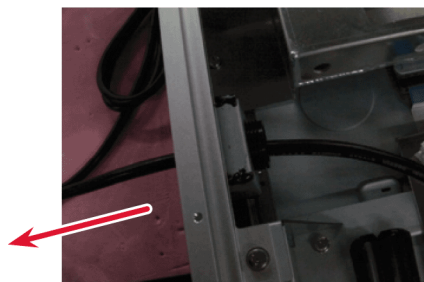
- Undo the two screws to remove the main switch board from the metal holder fitting and replace it with the replacement board. (SCR BIN+SW+W3X6)



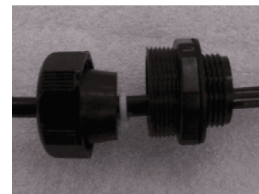
- Undo the two screws to remove the RC LED board from the metal holder fitting and replace it with the replacement board. (SCR BIN+SW+W3X6)



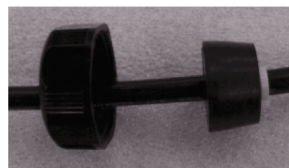
- Pull the power cord out of the hole in the waterproof nut.



- Undo the waterproof nut using a spanner to disassemble it.



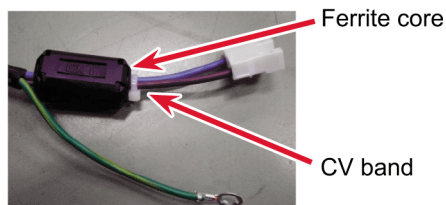
- Open the slit of the rubber packing which is located inside the waterproof nut to remove the rubber packing from the power cord.
- Pull the waterproof nut off the power cord.



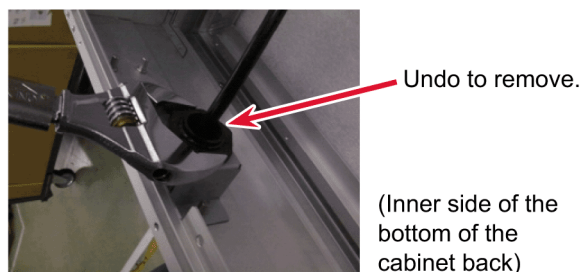
8.20. How to replace the power cord

When replacing the power cord, the power cord has to be detached from the bottom of the cabinet back.

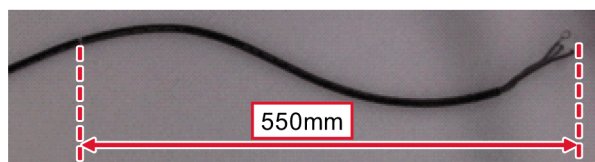
- Remove three ferrite cores which are fitted on the power board side of the power cord. Take care not to damage the power cord when cutting the CV band with nippers, etc.



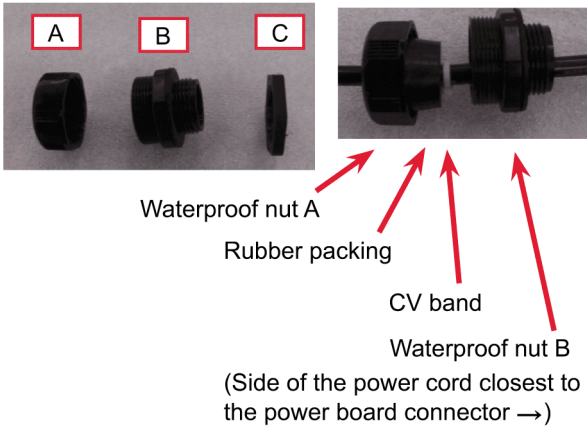
- Turn to loosen the waterproof nut which secures the power cord onto the cabinet back and remove the nut.



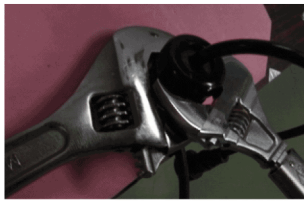
- Fit the CV band in a position which is 550 mm from the power board side connector, on the replacement power cord.



8. Fit the waterproof nuts A and B (out of A, B, and C) and rubber packing to the power cord in the position shown in the drawing. Fit the rubber packing where it can be secured by the CV band fitted earlier.



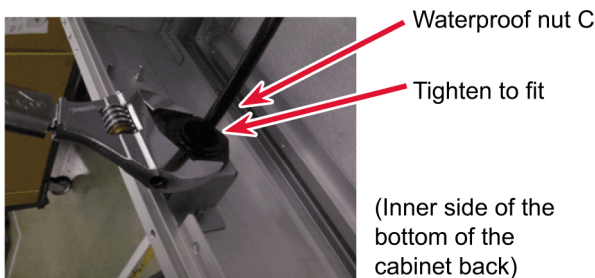
9. Holding the waterproof nut B with a spanner, tighten the waterproof nut A using a torque wrench. (size: 36.2mm, Tightening torque: 50 kgf•cm) When threads of the waterproof nuts A and B are misaligned, correct their position to make them fit, then turn.



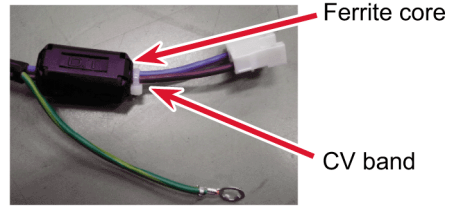
10. Put the power board side connector of the power cord through the hole in the cabinet back.



11. Tighten the waterproof nut C using a torque wrench to fit the power cord onto the cabinet back. (size: 36.2mm, Tightening torque: 50 kgf•cm)



12. Fit one ferrite core with a CV band on the power-board-side connector part of the power cord.



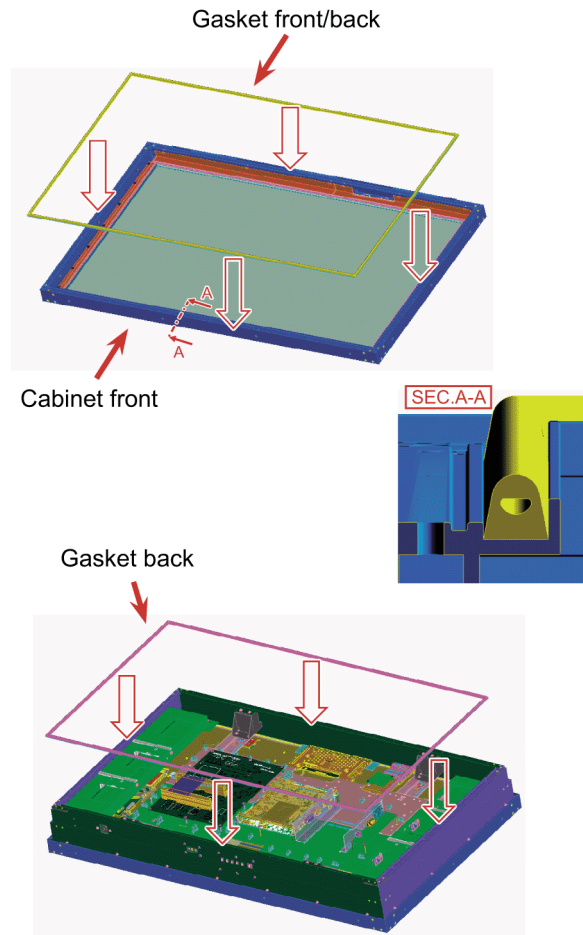
8.21. How to replace the gaskets

Precautions for replacement of the gaskets

The gaskets shown in the drawing are important parts which must be installed between the cabinet front, cabinet back, and back plate to keep the joins airtight to ensure dustproof and waterproof performance. They should be replaced every three to four years or if anything unusual is noticed during inspection or repair.

1. Remove the gasket from between the cabinet front and cabinet back, and replace it with the replacement gasket.
2. Remove the gasket from between the cabinet back and back plate, and replace it with the replacement gasket.

* Ensure the gasket is fitted tightly into the groove.

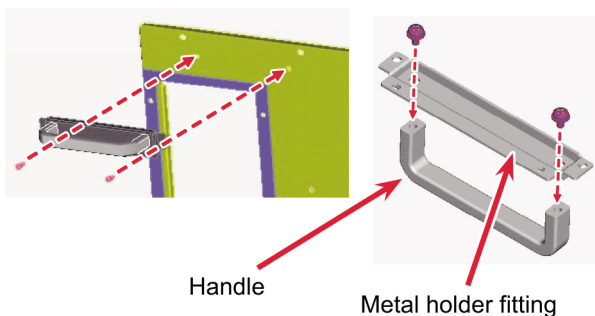


8.22. How to remove the handles

Take the following steps to change the handles when the handle gets damaged, etc.

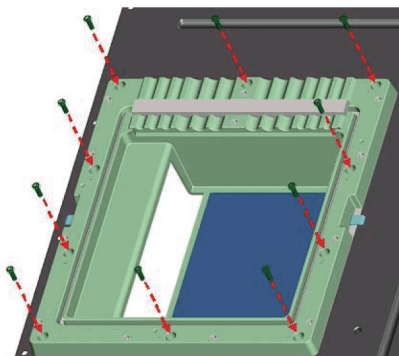
1. Undo the screws shown in the drawing to remove the handle from the back plate together with the metal holder fitting. (SPECIAL SCREW 4X10)
2. Undo the screws shown in the drawing to remove the handle from the metal holder fitting. (SPECIAL SCREW 5X12)

When replacing the handle with replacement part, reuse the existing metal holder fitting because the metal holder fitting is not a replacement part.



8.23. How to replace the AV cover (bottom)

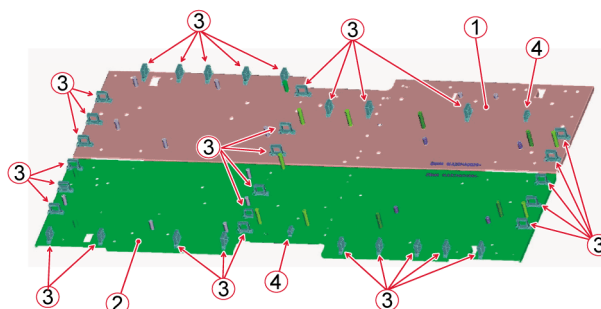
1. Undo the ten screws to remove the AV cover (bottom) from the back plate. (SPECIAL SCREW 4X12)
2. Replace it with the replacement AV cover bottom (bottom).



The replacement AV cover (bottom) is a single unit part including gasket and gel for the wire outlet.

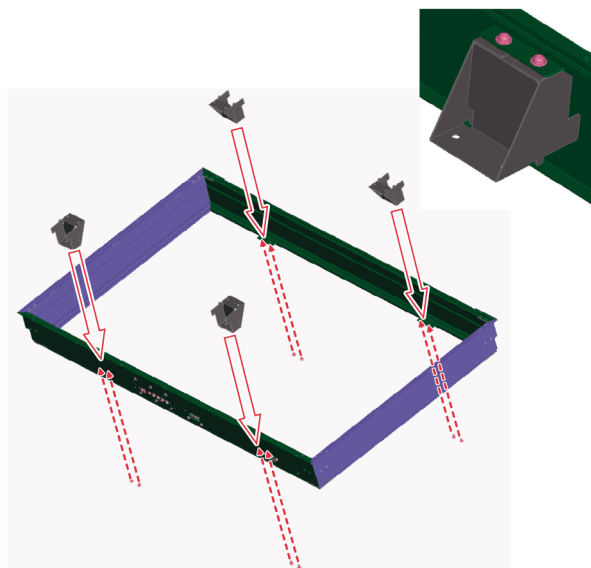
8.24. Position for the hook holds cables

The position for fitting the hook for holding cables, etc. is as shown in the drawing of the metal fitting A and B for the chassis base.



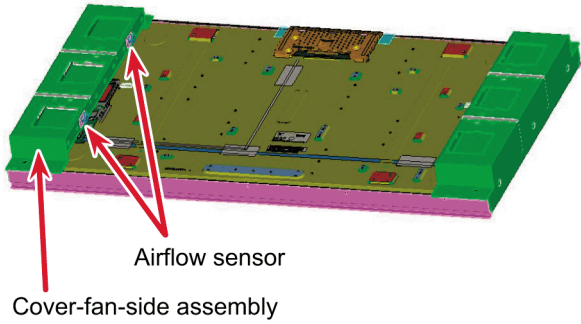
8.25. How to replace the cabinet back

1. Remove the main switch board, RC LED board, and the power cord from the cabinet back.
2. Undo eight screws to remove the metal panel holder fittings. (SCR BIN+SW+W 4X10)
3. Replace it with the replacement cabinet back.

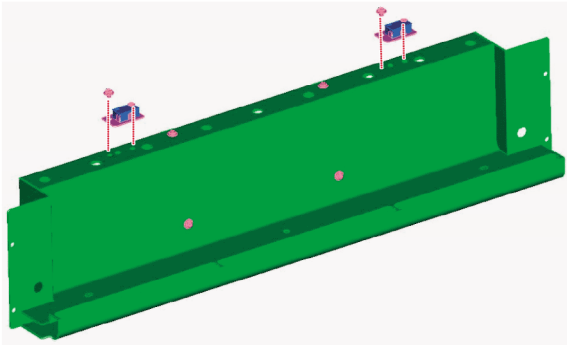


8.26. How to replace the airflow sensor

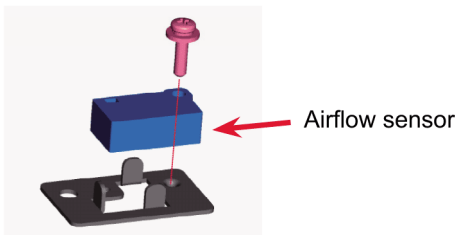
Two airflow sensors are placed in the positions shown in the drawing. Take the following steps to replace the airflow sensors.



1. Remove the cover-fan-side assembly.
2. Undo the screws shown in the drawing to remove the airflow sensors together with the holder. (SCR BIN+SW+W 4X10)



3. Undo the screws shown in the drawing to remove the airflow sensors. (SCR BIN+SW+W 3X12)
4. Replace them with the replacement airflow sensors.

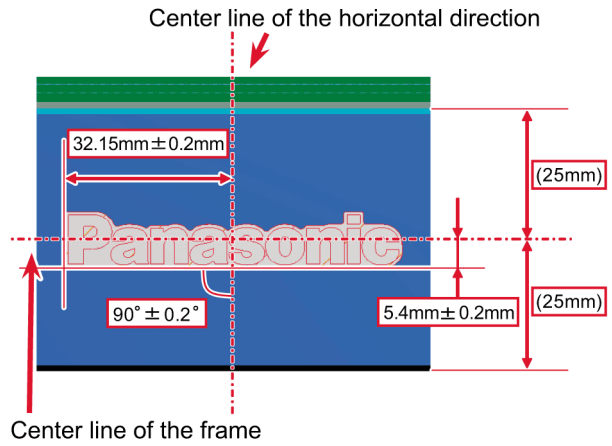


8.27. How to replace the Panasonic badge

* The Panasonic badge is attached to the replacement cabinet front, but the Panasonic badge itself can be also supplied as a single part. Take the following steps to replace the Panasonic badge.

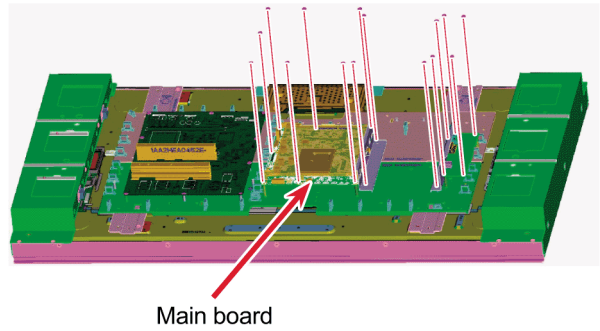
1. Detach the Panasonic badge
2. Attach the replacement Panasonic badge to the specified

position on the cabinet front as shown in the drawing.

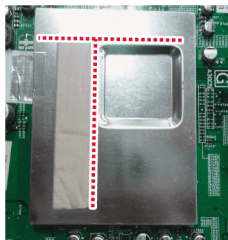


8.28. How to replace the gaskets

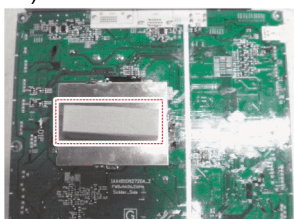
The gaskets are fitted in the following positions of this unit. When replacing any parts around them, stick the replacement gasket together before putting them in place.



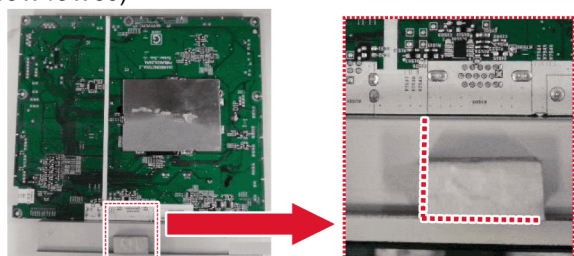
Protective plate for the main board (15 x 10 x 70)



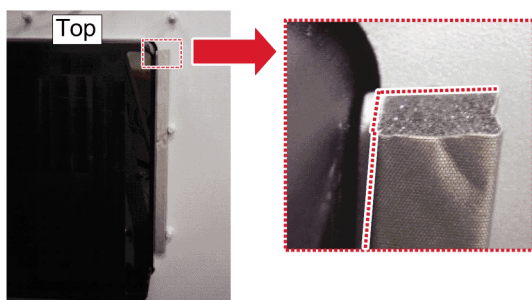
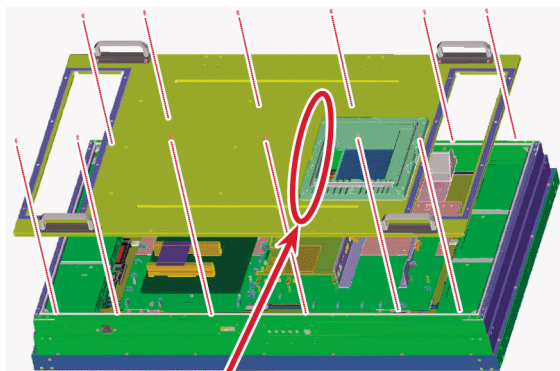
Back side of protective plate for the main board
(35 x 35 x 70)



Back side of protective plate for the main board
(15 x 15 x 30)



Back side of back plate, side of the pin cover bottom
(95 x 95 x 170)



9 Measurements and Adjustments

9.1. About a setup of a touch panel

- Please carry out [the calibration of touch panel] after exchanging touch panels.
- When setting up a touch panel, the personal computer with which driver software was installed is required.
* For details, please refer to [the volume on operation manual touch panel.]
- After connecting a personal computer with a touch panel, when recognized as a new device, please set up [plug and play].

Connections and Plug-Ins

1 Activate power to the display and computer.

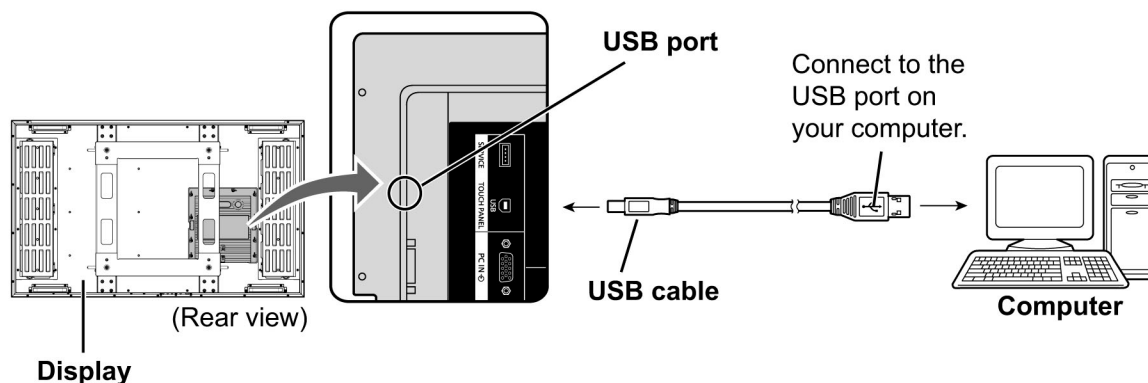
Check that the computer's OS starts up.

2 Connect the display and the computer with the USB cable.

When connected, Plug & Play starts.

Notes:

- Connect the USB cable only after installing the Driver software.
- Check that the USB power supply of your computer is a max. 500 mA.



■ Plug & Play

Using Plug & Play, the display is automatically detected as a USB device when the USB cable is connected.
(The operating window that appears after that differs slightly according to OS.)
Plug & Play starts up according to the number of connected display.

Windows Vista/7

The “Found New Hardware” window appears and the device driver is automatically installed. However, with Windows Vista, installation ends without displaying any windows.

Windows XP

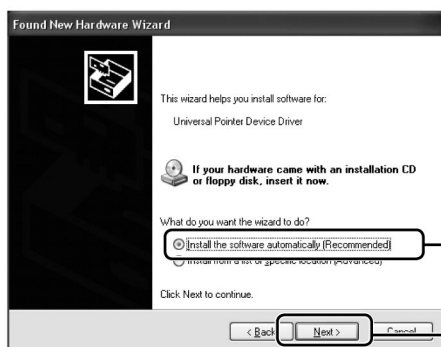
1



When a window similar to that at left appears, select “No, not this time”.

Click this button.

2



Select “Install the software automatically (Recommended)”.

Click this button.

3



When a warning message similar to that at left appears, click on the “Continue Anyway” button.

4



When a window similar to that at left appears, installation is complete.

Click this button.

Touch Panel Setup

How to Use the Driver Software

■ Driver Software Startup

The Driver software starts up automatically when the computer starts up.

The touch panel works only when the touch panel and computer are connected over a USB cable.

Note:

The touch panel may not respond smoothly for a while after the Driver software starts up.

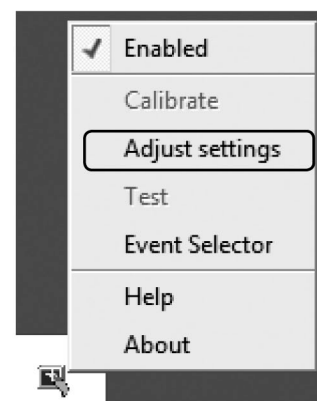
■ Control Panel Startup

There are two ways to start up the setup panel. (The screen is Windows 7)

Method 1

Click on the icon in the task tray and select “Adjust settings” from the menu that appears.

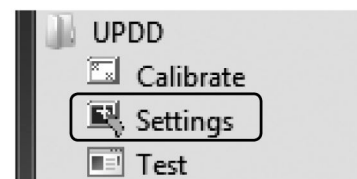
The setup panel “UPDD Console” starts up.



Method 2

Select [Start] → [All Programs] → [UPDD] → [Settings].

The setup panel “UPDD Console” starts up.



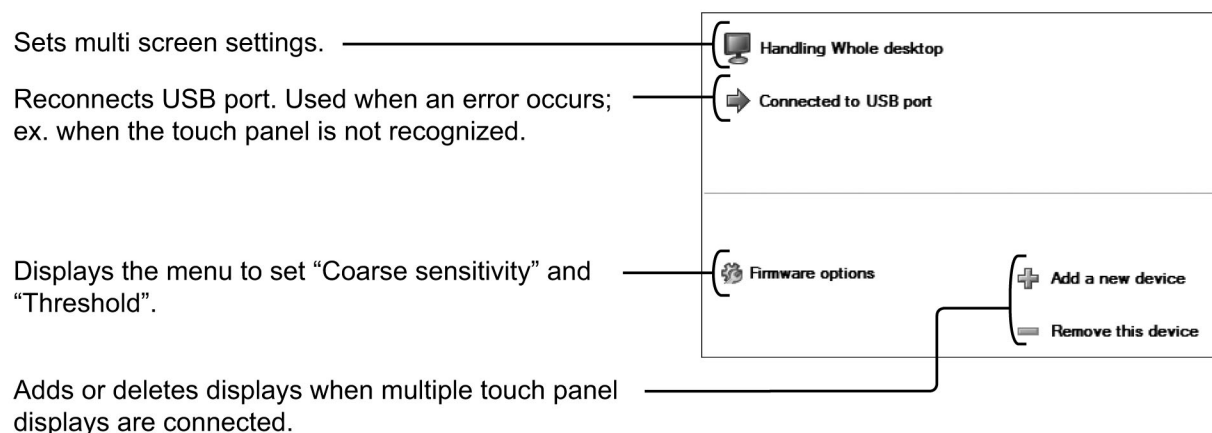
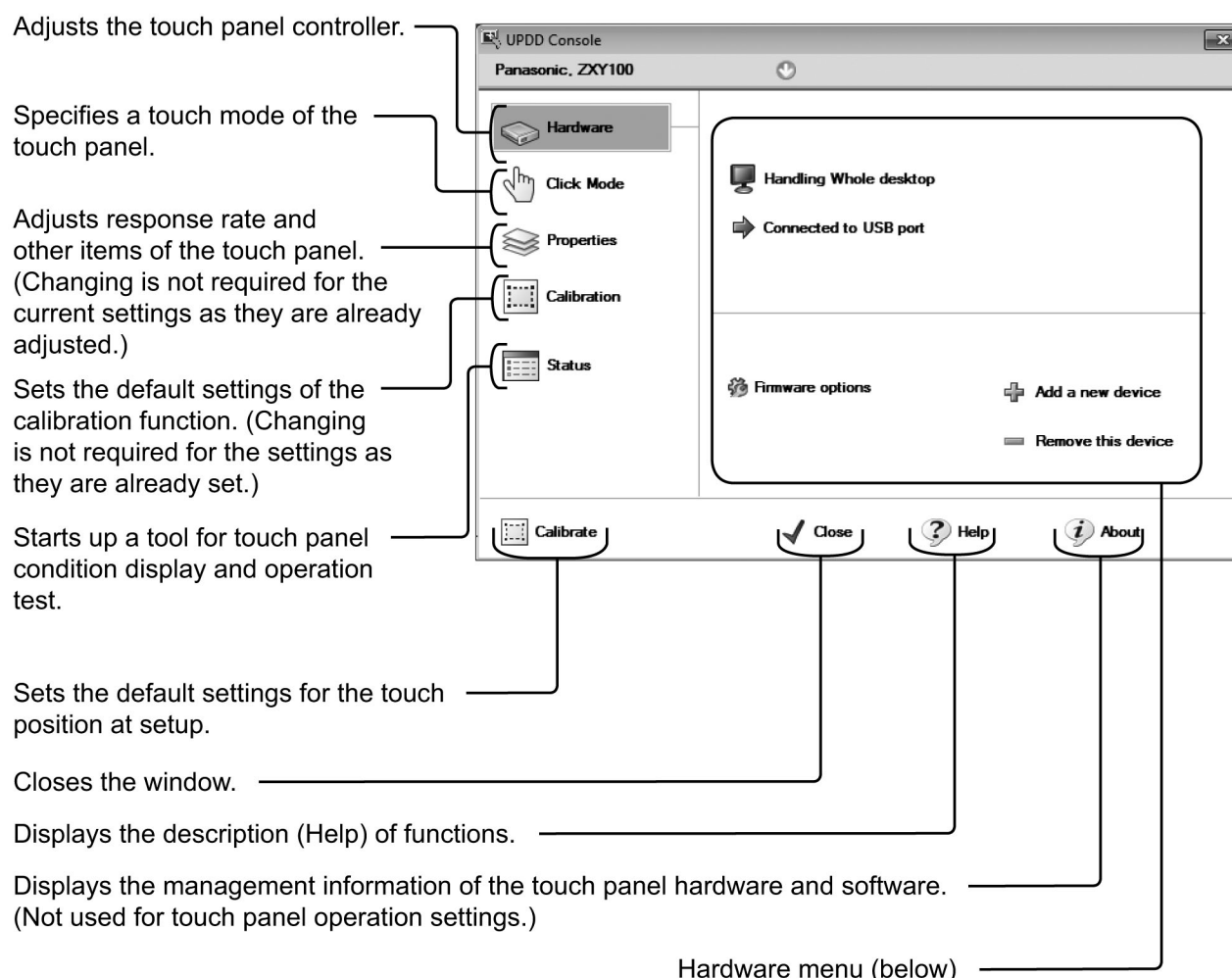
■ Exit Driver Software

When you click “Enabled” from the menu displayed when the task tray icon is clicked, an “Are you sure you want to disable this device?” message is displayed. Click “Yes” to disable the driver.

Touch Panel Setup

Explanation of Setup Panel Items

- When the UPDD Driver software is started up, the UPDD console screen appears.

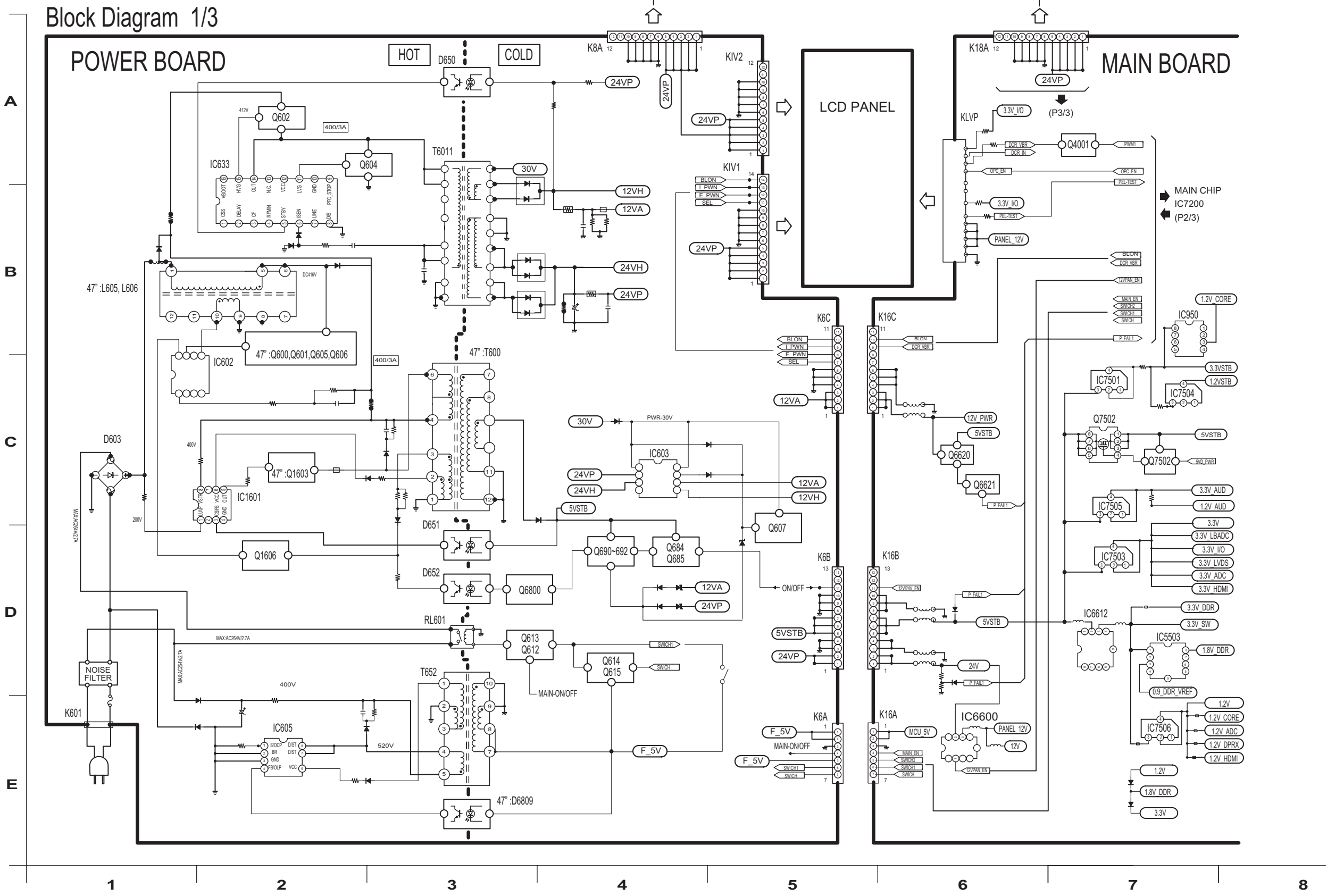


- "Panasonic. ZXY100" is displayed in red at the top of the UPDD console screen when the USB cable is disconnected.

9 Block Diagram

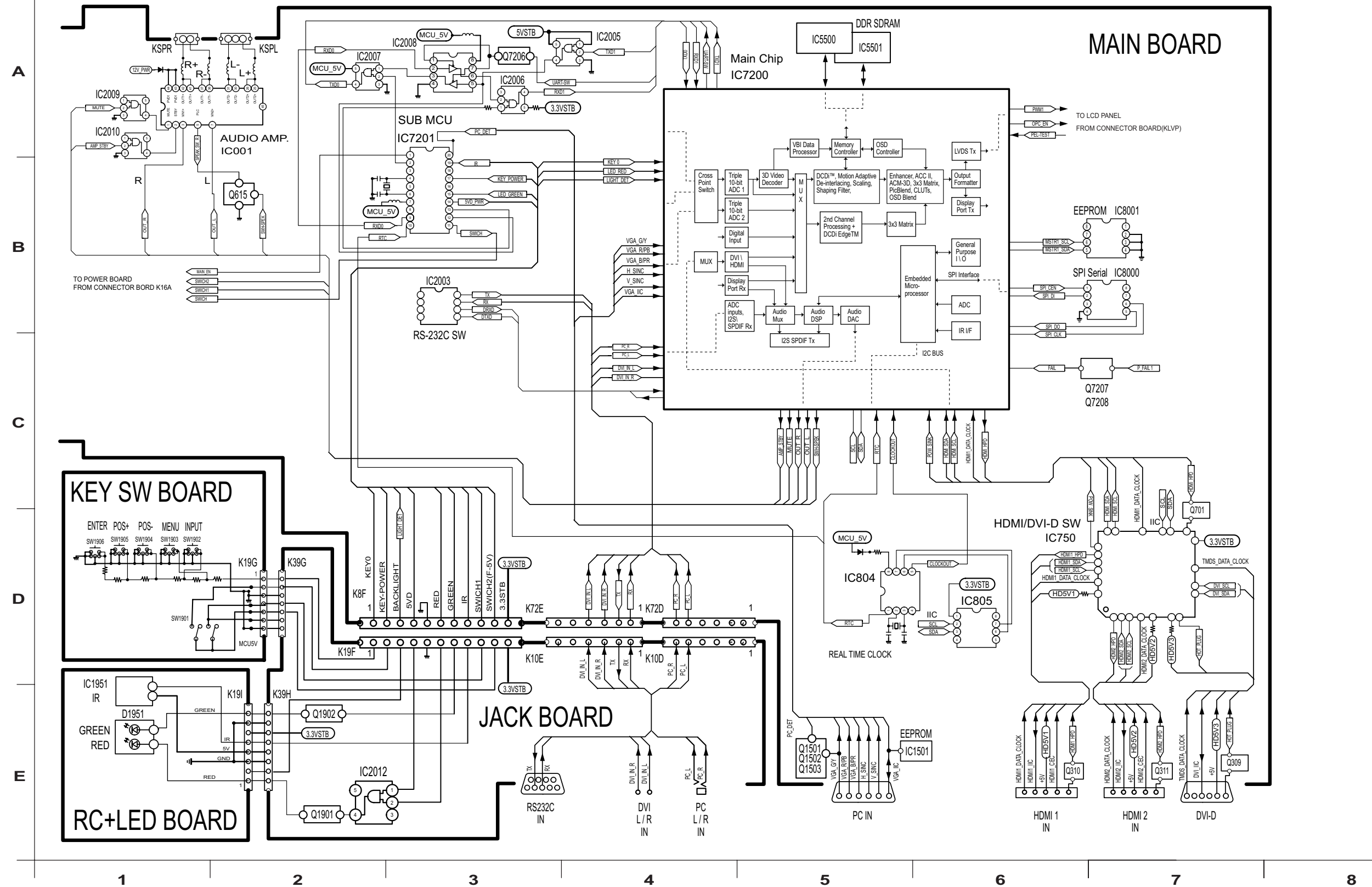
TH-47LFT30

Block Diagram 1/3



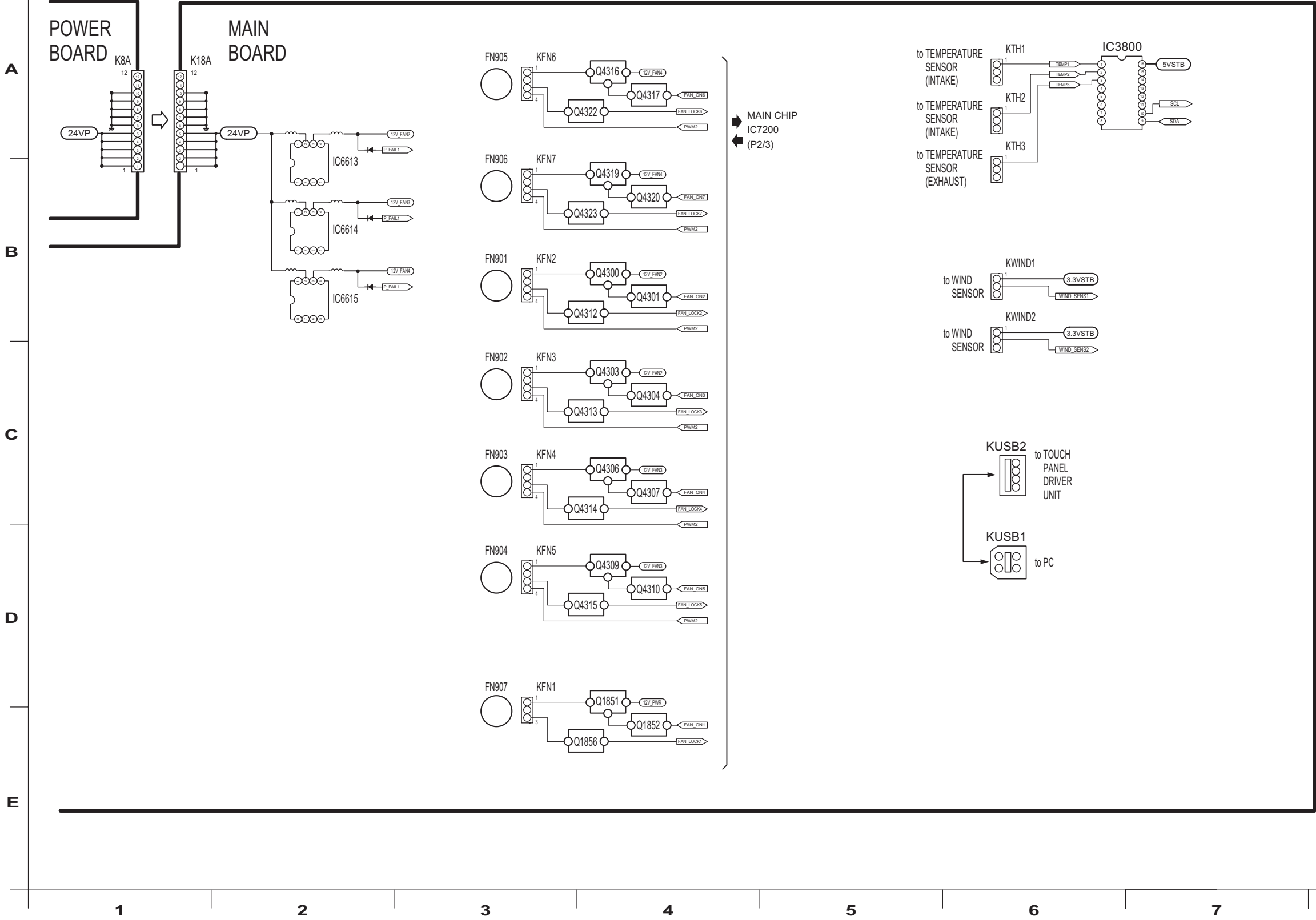
TH-47LFT30

Block Diagram 2/3



TH-47LFT30

Block Diagram 3/3



POWER KIV1 ~ INVERTER

①2.0mm pitch	
PIN1	24VP
PIN2	24VP
PIN3	24VP
PIN4	24VP
PIN5	24VP
PIN6	GND
PIN7	GND
PIN8	GND
PIN9	GND
PIN10	GND
PIN11	SEL
PIN12	E_PWM
PIN13	I_PWM
PIN14	BL_ON

POWER KIV2 ~ INVERTER

②2.0mm pitch	
PIN1	24VP
PIN2	24VP
PIN3	24VP
PIN4	24VP
PIN5	24VP
PIN6	GND
PIN7	GND
PIN8	GND
PIN9	GND
PIN10	GND
PIN11	(NC)
PIN12	(NC)

POWER K8A ~ MAIN K18A

③2.0mm pitch	
PIN1	24VP
PIN2	24VP
PIN3	24VP
PIN4	24VP
PIN5	24VP
PIN6	GND
PIN7	GND
PIN8	GND
PIN9	GND
PIN10	GND
PIN11	(NC)
PIN12	(NC)

POWER K6C ~ MAIN K16C

④2.0mm pitch	
PIN1	12V_PWR
PIN2	12V_PWR
PIN3	12V_PWR
PIN4	GND
PIN5	GND
PIN6	GND
PIN7	SEL
PIN8	E_PWM
PIN9	I_PWM
PIN10	BL_ON
PIN11	(NC)

POWER K6B ~ MAIN K16B

⑤2.0mm pitch	
PIN1	24V
PIN2	24V
PIN3	GND
PIN4	GND
PIN5	5VSTB
PIN6	5VSTB
PIN7	5VSTB
PIN8	GND
PIN9	GND
PIN10	GND
PIN11	12V/24V_EN
PIN12	(NC)
PIN13	(NC)

POWER K6A ~ MAIN K16A

⑥2.0mm pitch	
PIN1	MCU_5V
PIN2	MCU_5V
PIN3	GND
PIN4	MAIN_EN
PIN5	MCU_5V
PIN6	SWTCH1
PIN7	SWTCH

MAIN KWIND1,2 ~

Wind amount sensor

⑦2.0mm pitch	
PIN1	3.3VSTB
PIN2	WIND_SENS1,2
PIN3	GND

JACK K10D ~ MAIN K72D

⑩1.5mm pitch	
PIN1	AV4_S
PIN2	GND
PIN3	AV_IN_R(audio)
PIN4	GND
PIN5	AV_IN_L(audio)
PIN6	GND
PIN7	AV_CVBS
PIN8	GND
PIN9	PC_IN_L(audio)
PIN10	GND
PIN11	PC_IN_R(audio)
PIN12	GND

JACK K10E ~ MAIN K72E

⑨1.5mm pitch	
PIN1	RX
PIN2	TX
PIN3	GND
PIN4	DVI_IN_R(audio)
PIN5	GND
PIN6	DVI_IN_L(audio)
PIN7	GND
PIN8	AV4_Y
PIN9	GND
PIN10	AV4_C

JACK K19F ~ MAIN K8F

⑧1.5mm pitch	
PIN1	KEY0
PIN2	KEY_POWER
PIN3	LIGHT_DET
PIN4	5VD
PIN5	GND
PIN6	LED_RED
PIN7	LED_GREEN
PIN8	IR
PIN9	SWTCH1
PIN10	MCU_5V

MAIN KFN2,3,4,5 ~ FN901,2,3,4

⑬2.0mm pitch	
PIN1	12V_FAN2
PIN2	GND
PIN3	FAN_LOCK2,3,4,5
PIN4	PWM2

KEY SW K19G ~ JACK K39G

⑫1.5mm pitch	
PIN1	KEY_IN
PIN2	KEY_POWER
PIN3	GND
PIN4	SWTCH1
PIN5	MCU_5V
PIN6	SWTCH1
PIN7	GND

JACK K39H ~ ~RC+LED K19H

⑬1.5mm pitch	
PIN1	LED_R
PIN2	LIGHT_DET
PIN3	GND
PIN4	SWTCH1
PIN5	IR
PIN6	3-3VSTB
PIN7	GND
PIN8	LED_G

MAIN KSPR ~ JACK K001R

⑭2.0mm pitch	
PIN1	SP_R+
PIN2	SP_R-

MAIN KSPL ~ JACK K001L

⑮2.0mm pitch	
PIN1	SP_L-
PIN2	(NC)
PIN3	SP_L+

MAIN KFN1 ~ FN907

⑪2.0mm pitch	
PIN1	12V_POW
PIN2	GND
PIN3	FAN_LOCK1

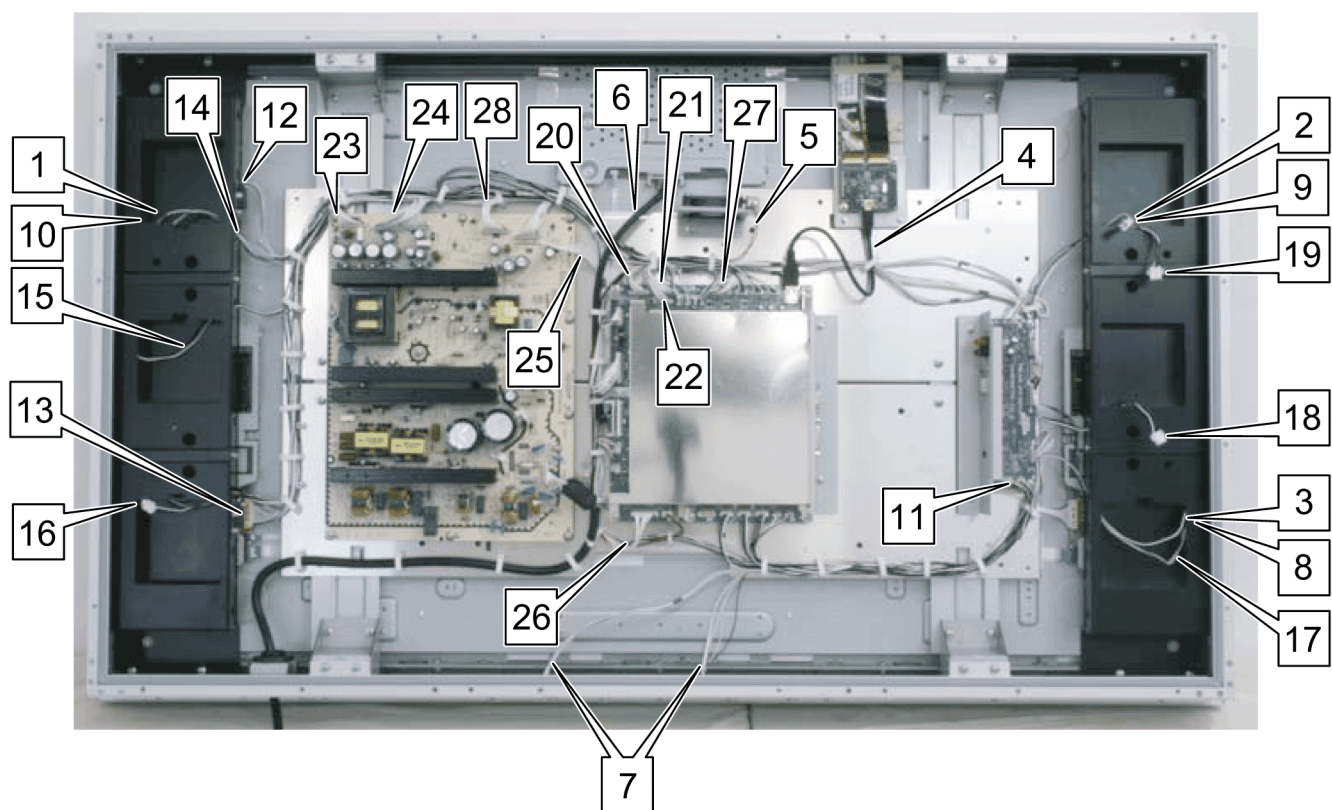
MAIN KFN6,7 ~ FN905,6

⑰2.0mm pitch	
PIN1	12V_FAN4
PIN2	GND
PIN3	FAN_LOCK6,7
PIN4	PWM2

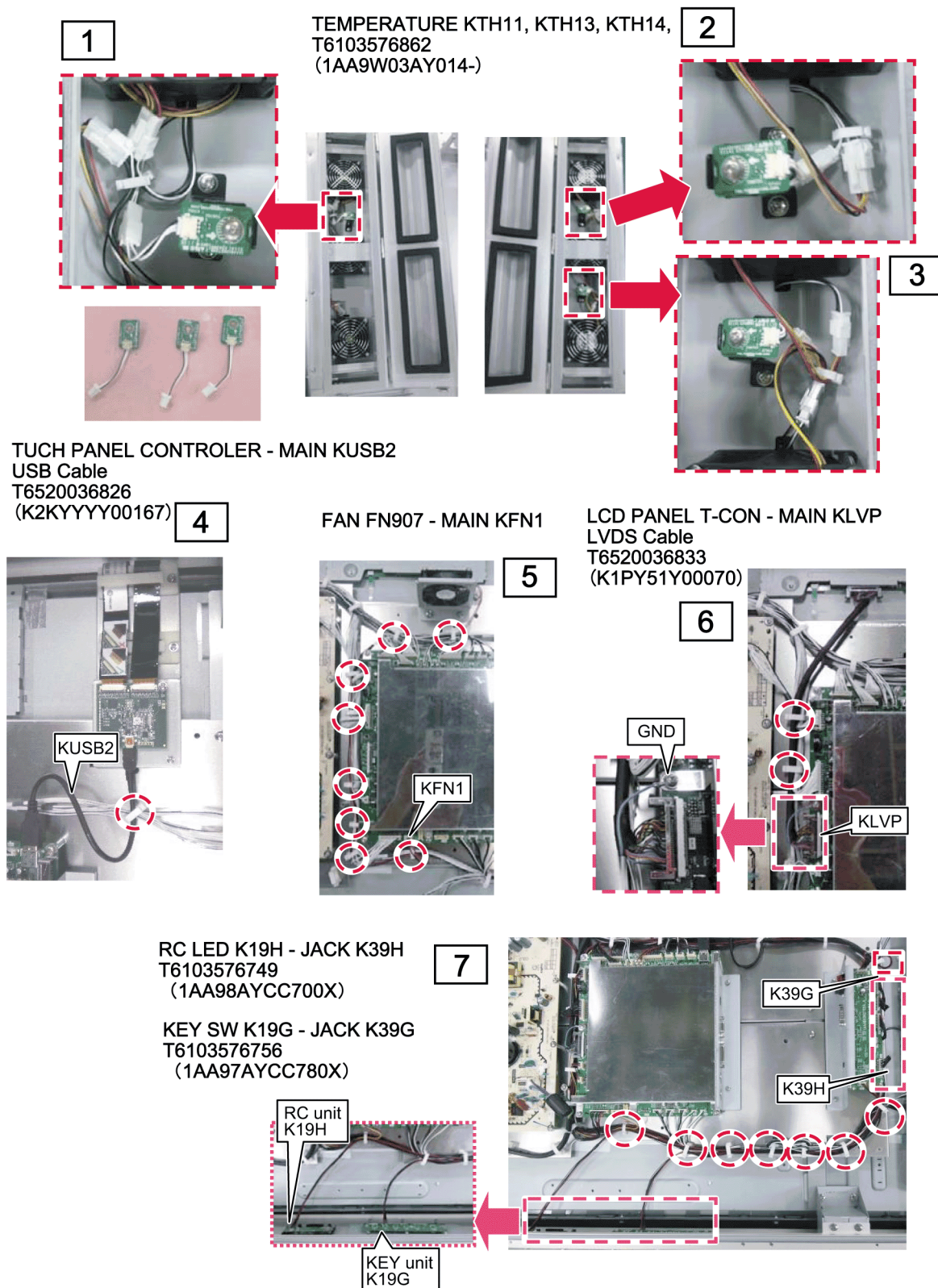
MAIN KTH1,2,3 ~ Temperature sensor

⑯2.0mm pitch	
PIN1	TEMP1,2,3
PIN2	GND
PIN3	GND

11.2. Wiring Connection Diagram (2)



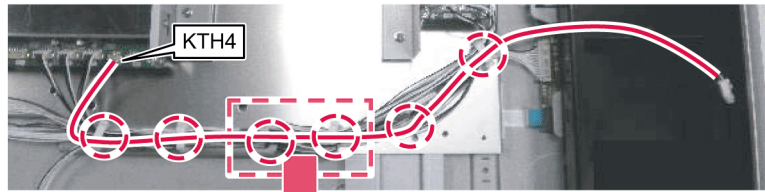
11.3. Wiring Connection Diagram (3)



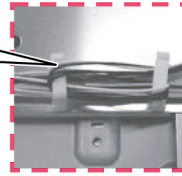
11.4. Wiring Connection Diagram (4)

MAIN KTH4 -
TEMPERATURE BOARD
T6103576886
(1AA9W03AY015-)

8

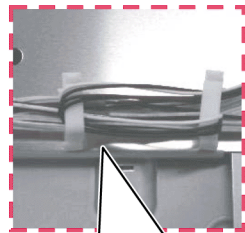


• 2 turn like place of figure.

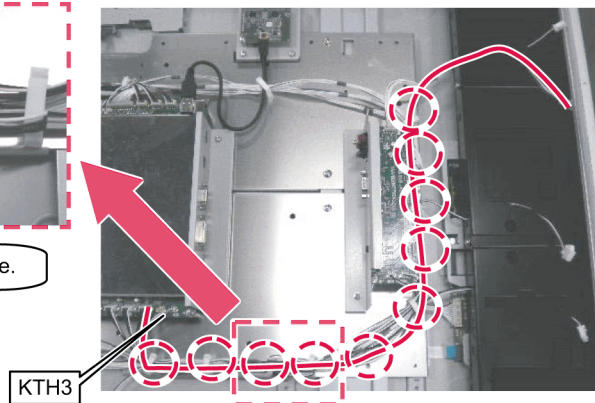


MAIN KTH3 -
TEMPERATURE BOARD
T6103576893
(1AA9W03AY015A)

9

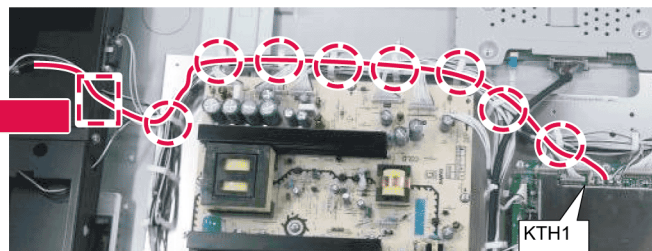
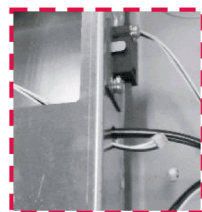


• 1 turn like place of figure.



MAIN KTH1 -
TEMPERATURE BOARD
T6103576886
(1AA9W03AY015-)

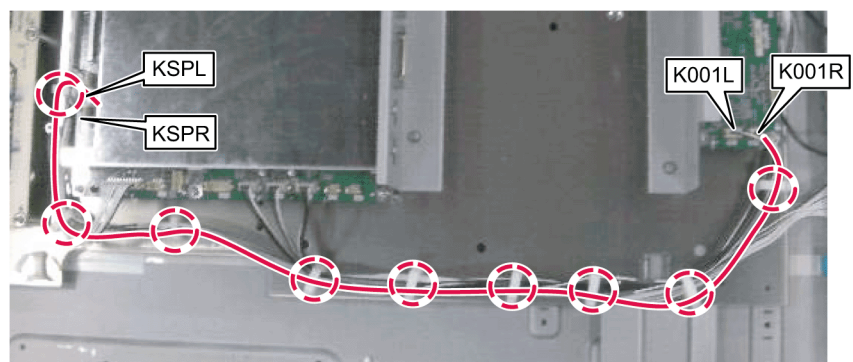
10



MAIN KSPL - JACK K001L
T6103576824
(1AA93BGDD660X)

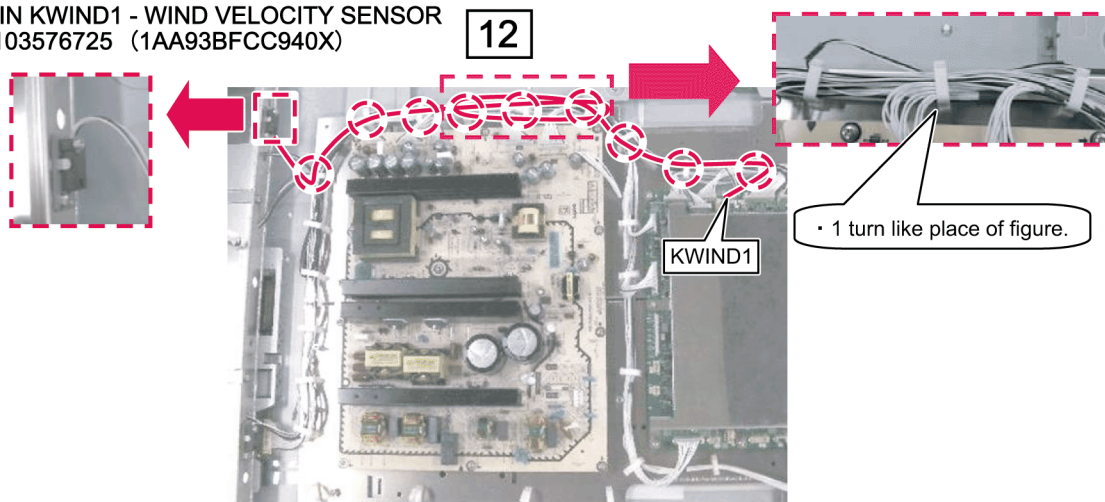
MAIN KSPR - JACK K001R
T6103576787
(1AA92BGDD660X)

11

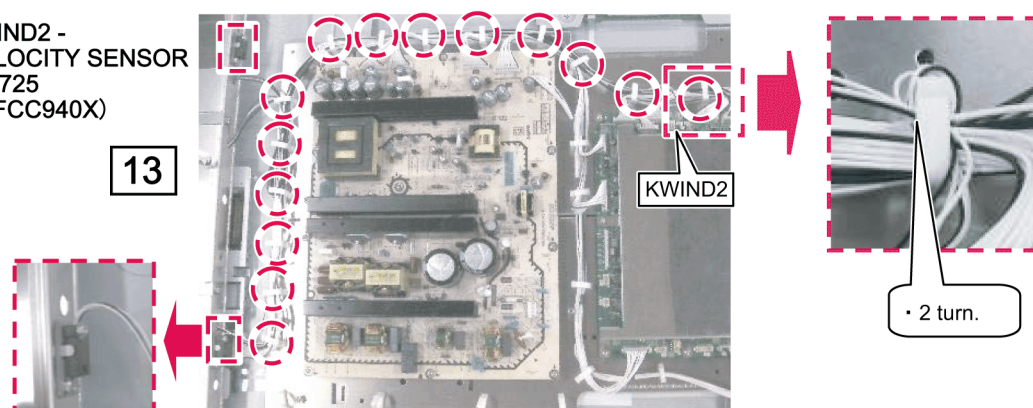


11.5. Wiring Connection Diagram (5)

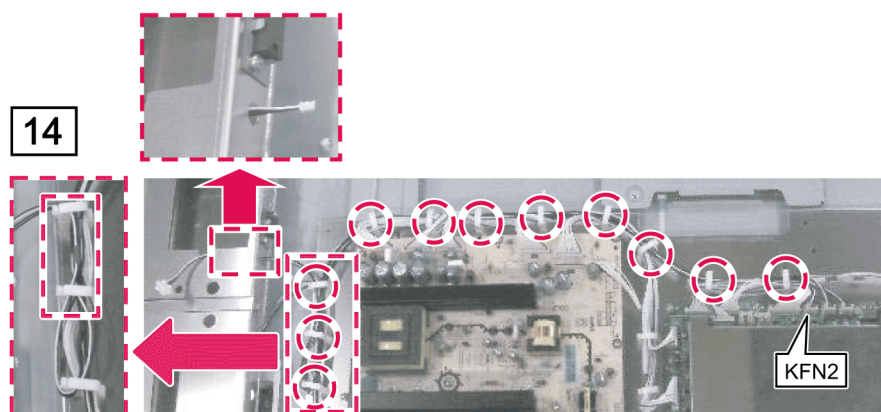
MAIN KWIND1 - WIND VELOCITY SENSOR
T6103576725 (1AA93BFCC940X)



MAIN KWIND2 - WIND VELOCITY SENSOR
T6103576725 (1AA93BFCC940X)



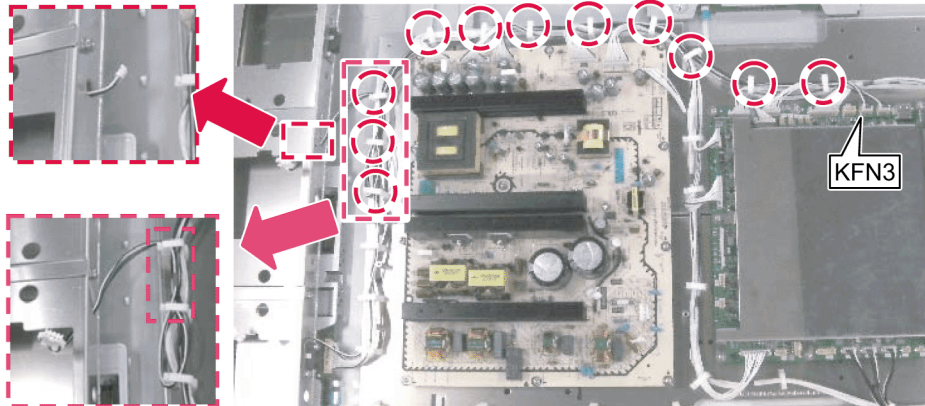
MAIN KFN2 - FAN
T6103576855 (1AA9W04BG019A)



11.6. Wiring Connection Diagram (6)

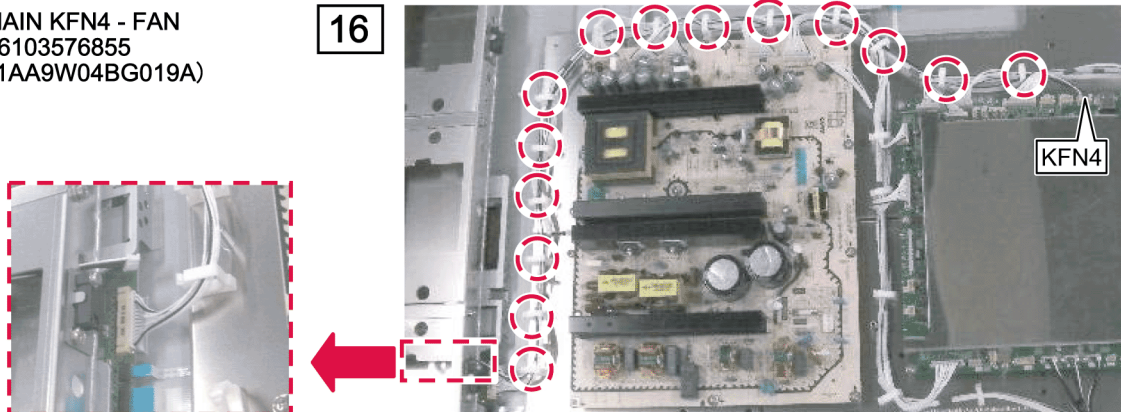
MAIN KFN3 - FAN
T6103576855
(1AA9W04BG019A)

15



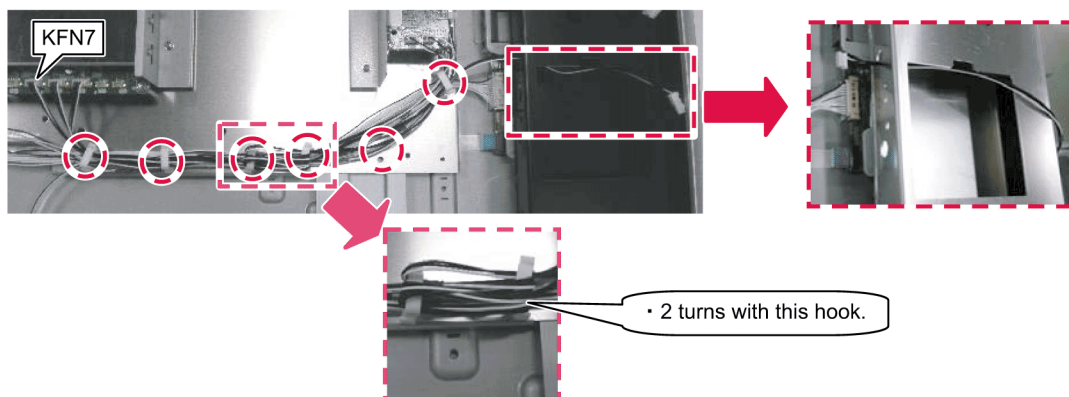
MAIN KFN4 - FAN
T6103576855
(1AA9W04BG019A)

16



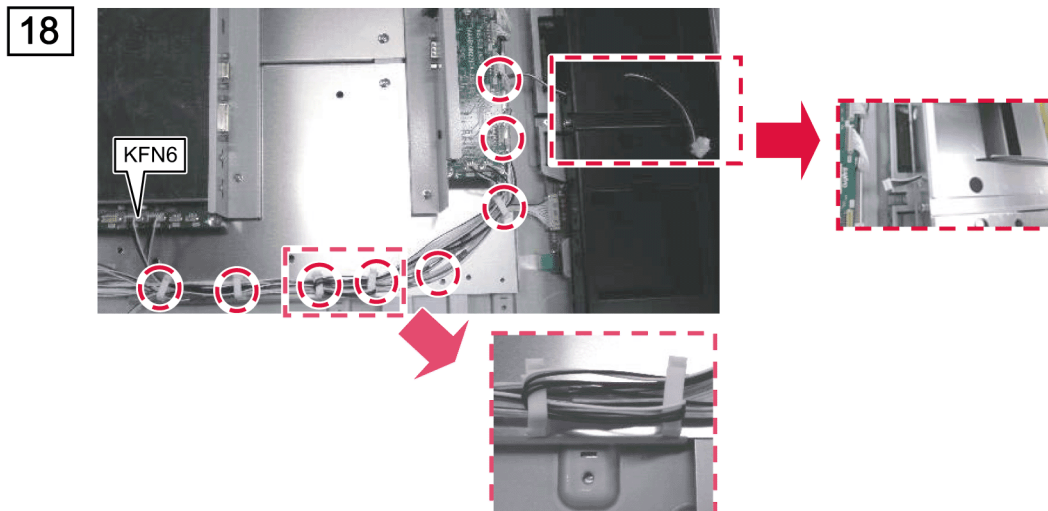
MAIN KFN7 - FAN
T6103576848
(1AA9W04BG019-)

17

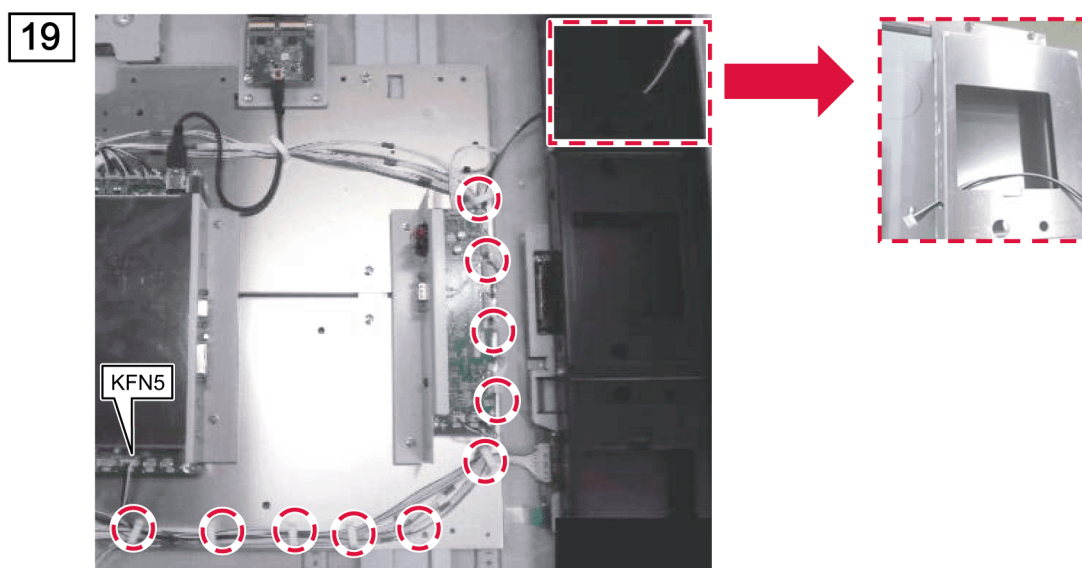


11.7. Wiring Connection Diagram (7)

MAIN KFN6 - FAN
T6103576848
(1AA9W04BG019-)



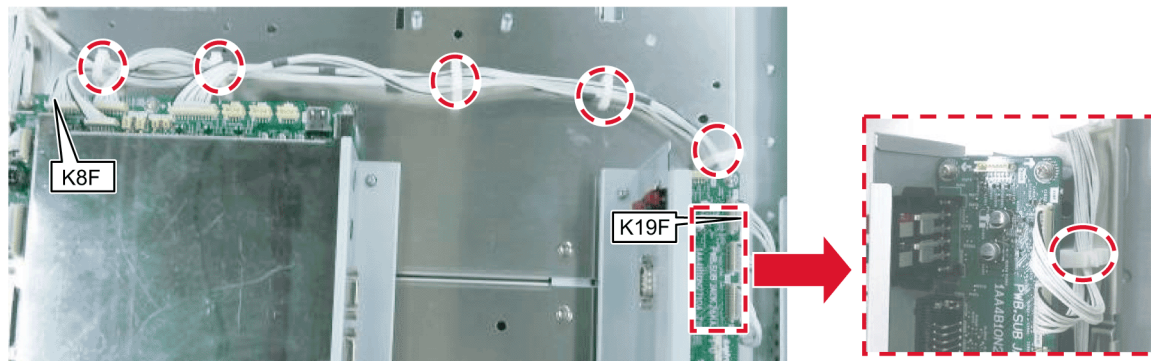
MAIN KFN5 - FAN
T6103576848
(1AA9W04BG019-)



11.8. Wiring Connection Diagram (8)

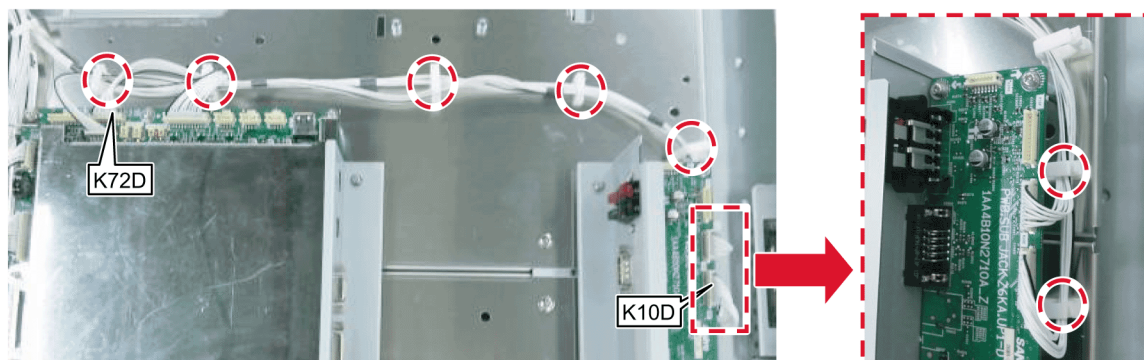
MAIN K8F - JACK K19F
T6103576732
(1AA9BAYCC580X)

20



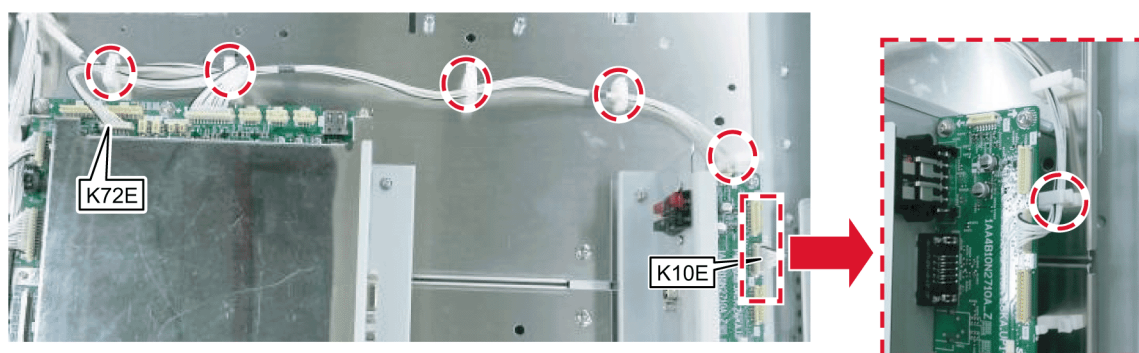
MAIN K72D - JACK K10D
T6103576763
(1AA9CAYCC580X)

21



MAIN K72E - JACK K10E
T6103576770
(1AA9AAYCC580X)

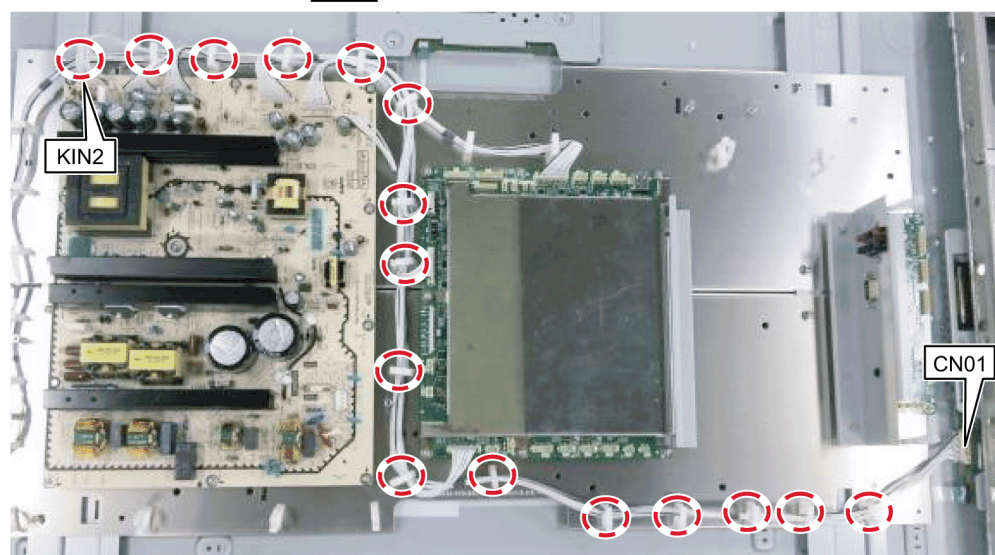
22



11.9. Wiring Connection Diagram (9)

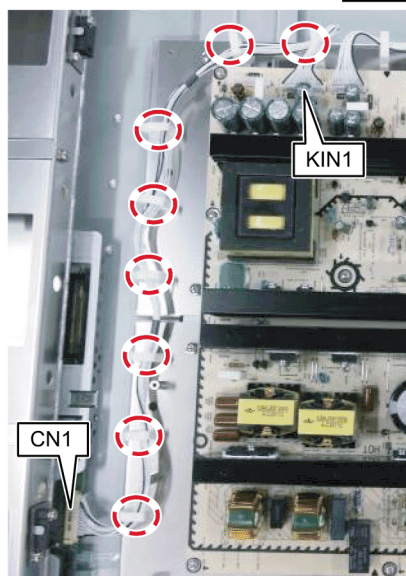
POWER KIN2 - LCD PANEL CN01
T6103576718
(1AA9CBGDDA14X)

23



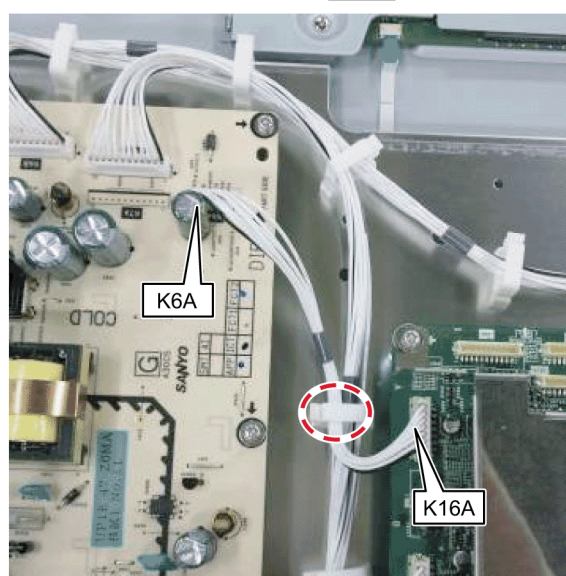
POWER KIN1 - LCD PANEL CN1
T6103576831
(1AA9W0EBG009-)

24



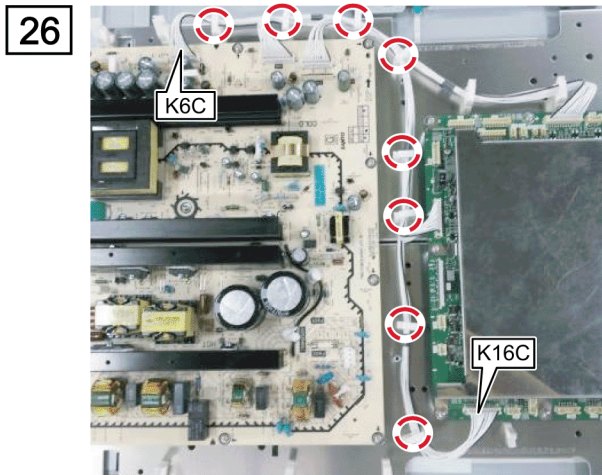
POWER K6A - MAIN K16A
T6103576701
(1AA97BGDD160X)

25

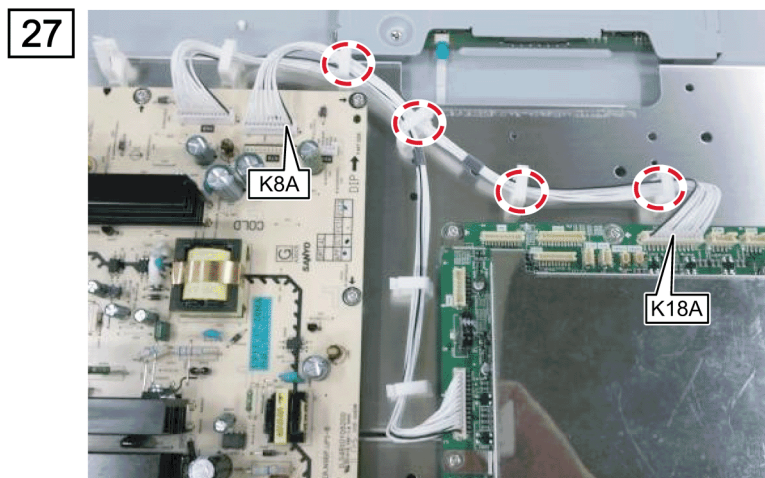


11.10. Wiring Connection Diagram (10)

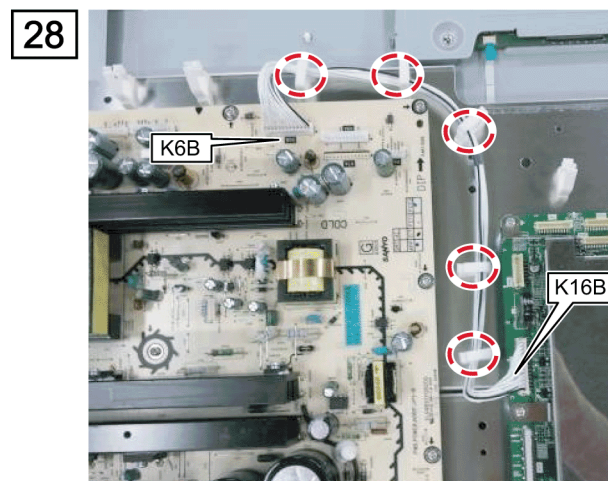
POWER K6C - MAIN K16C
T6103576688
(1AA9BBGDD660X)



POWER K8A - MAIN K18A
T6103576695
(1AA9CBGDD340X)



POWER K6B - MAIN K16B
T6103576671
(1AA9DBGDD400X)

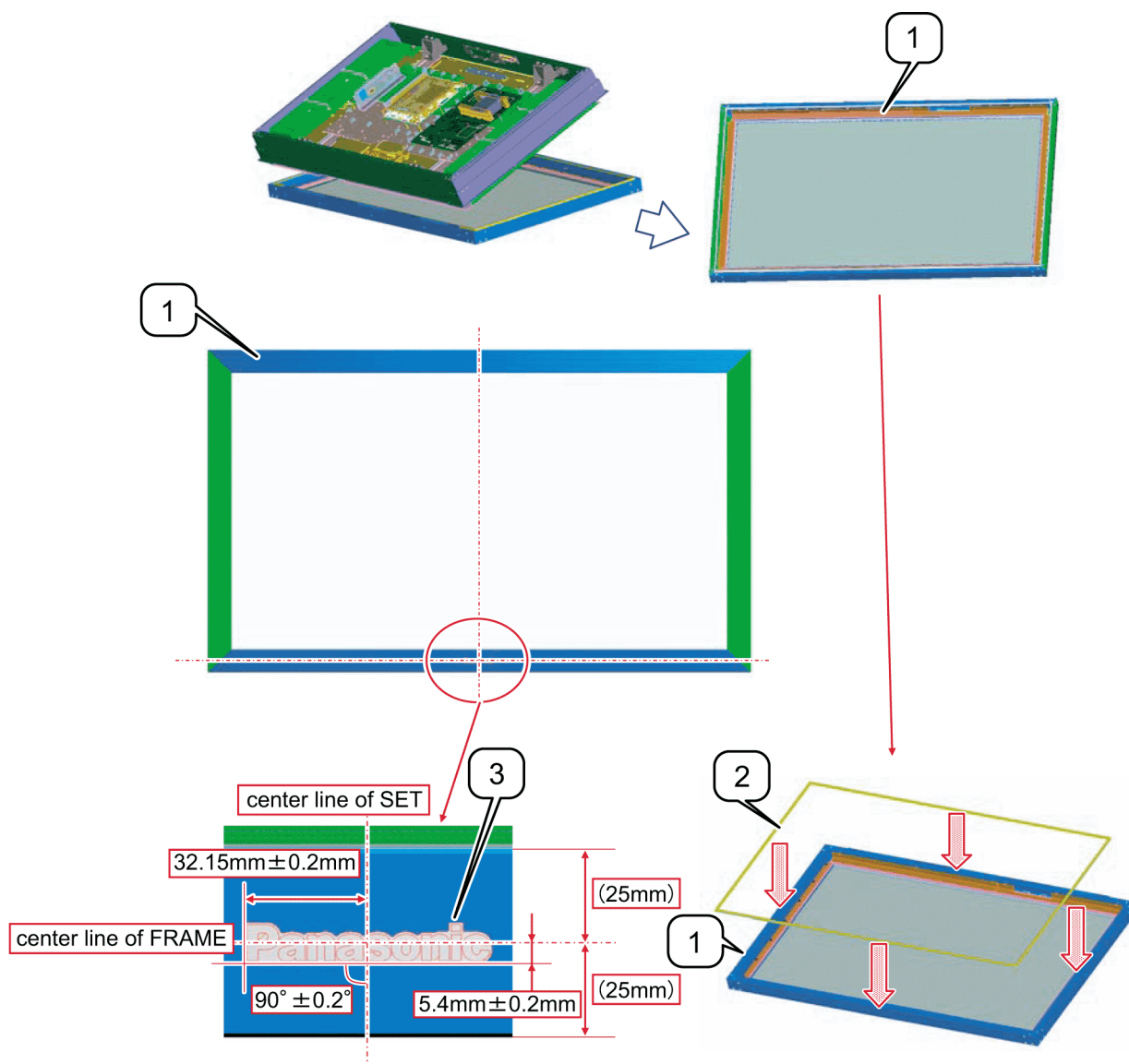


12 Exploded View and Replacement Parts List

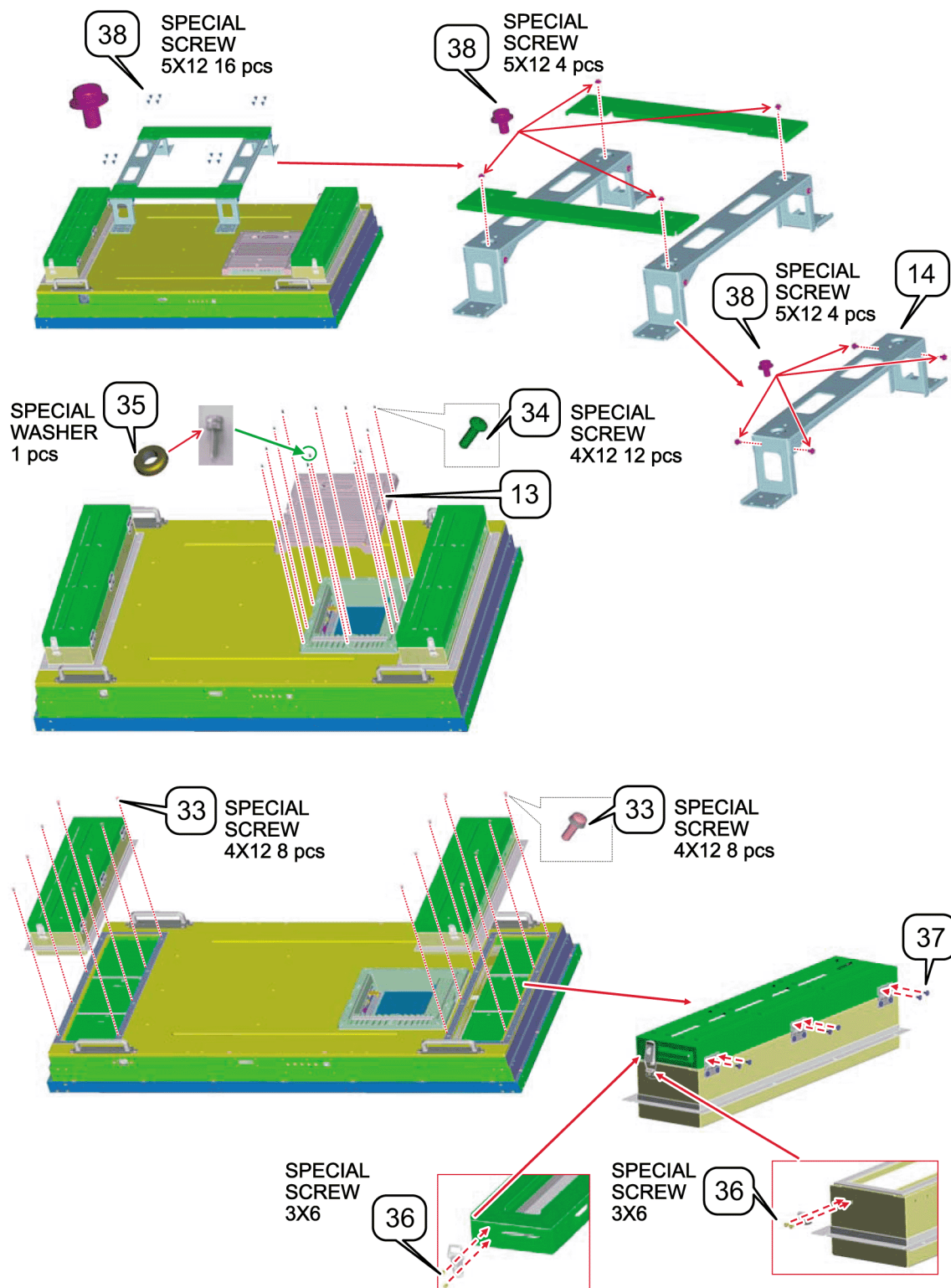
12.1. Exploded View and Mechanical Replacement Parts List

12.1.1. Exploded View

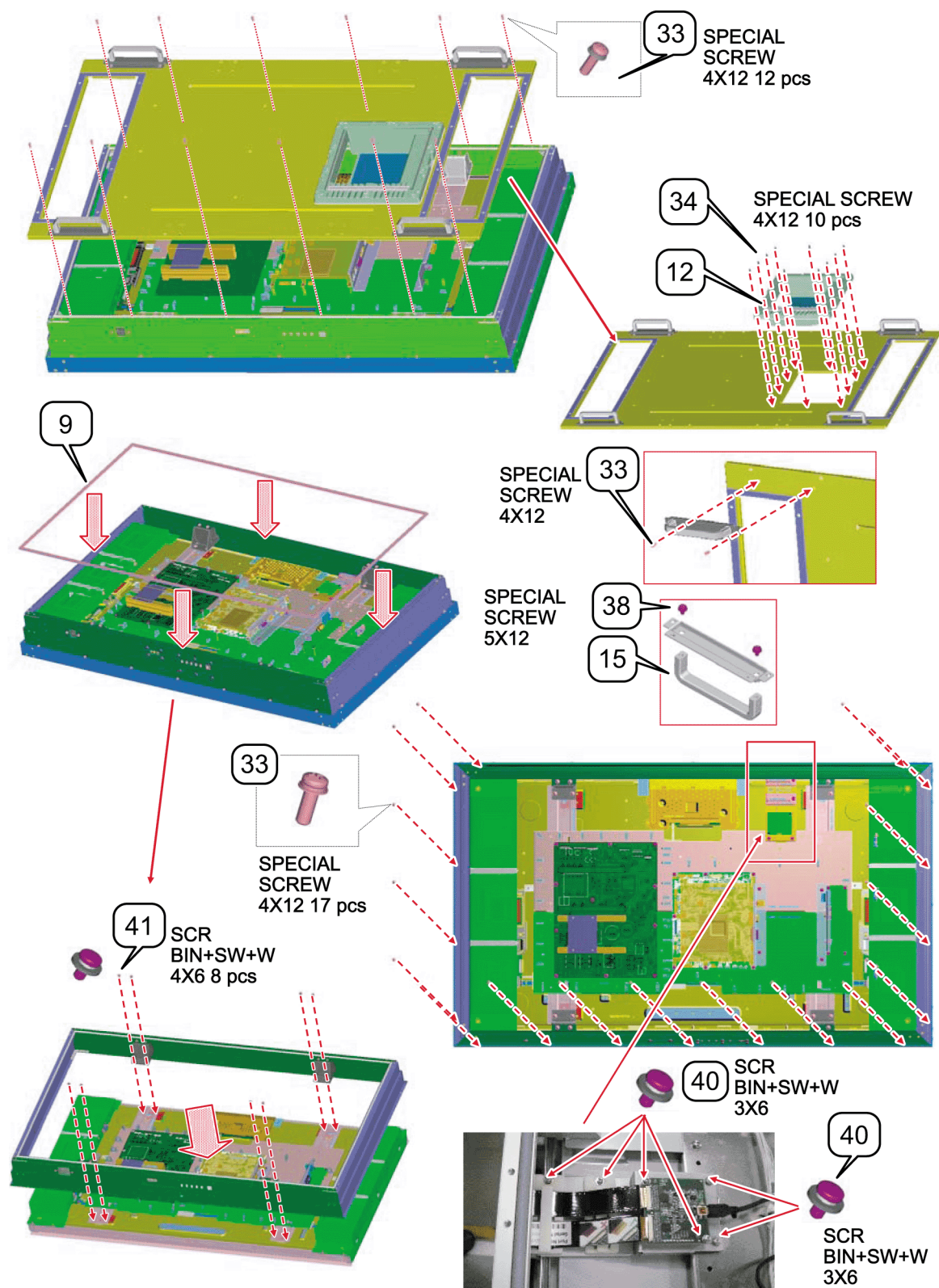
12.1.1.1. Exploded View (1)



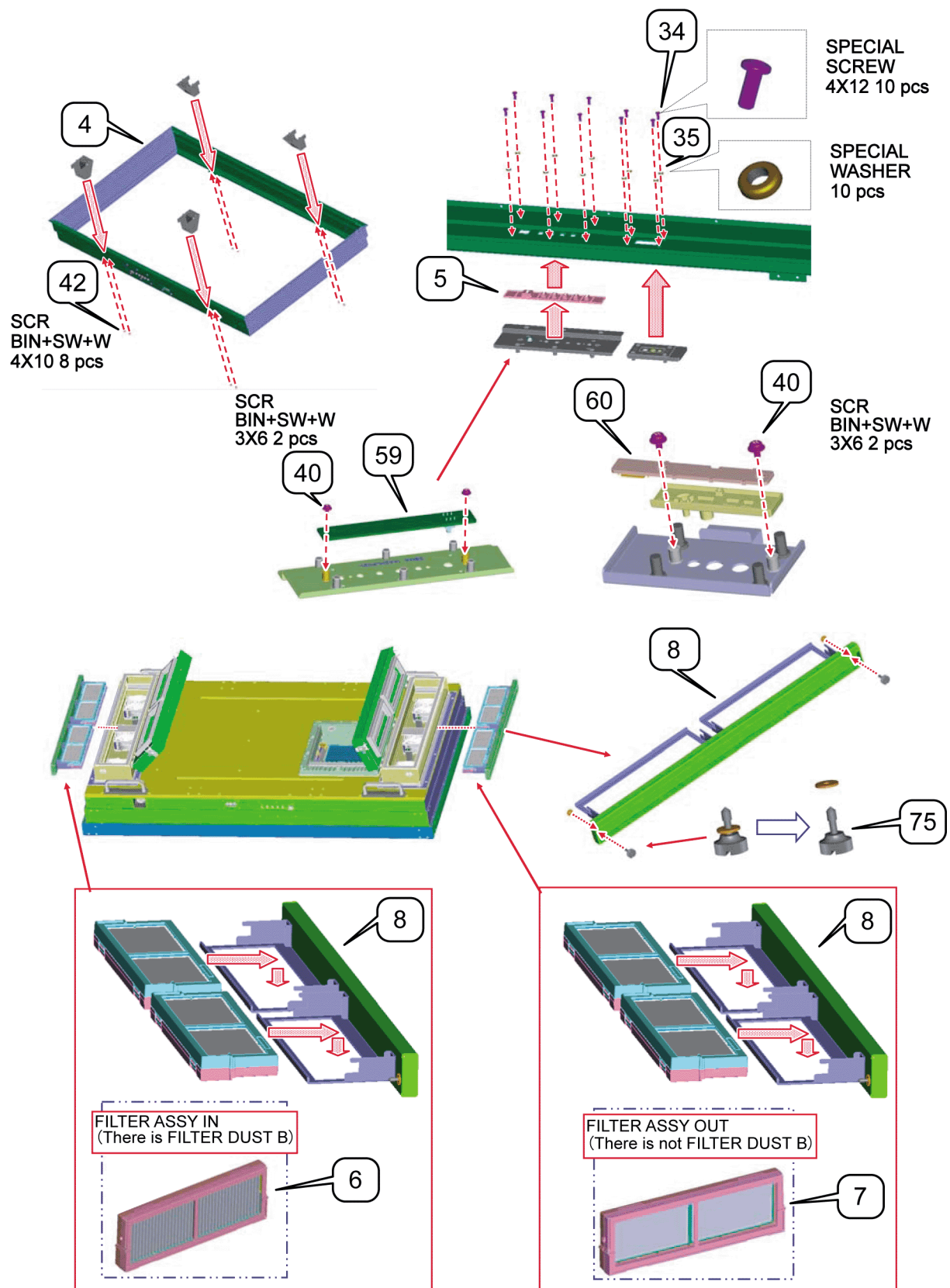
12.1.1.2. Exploded View (2)



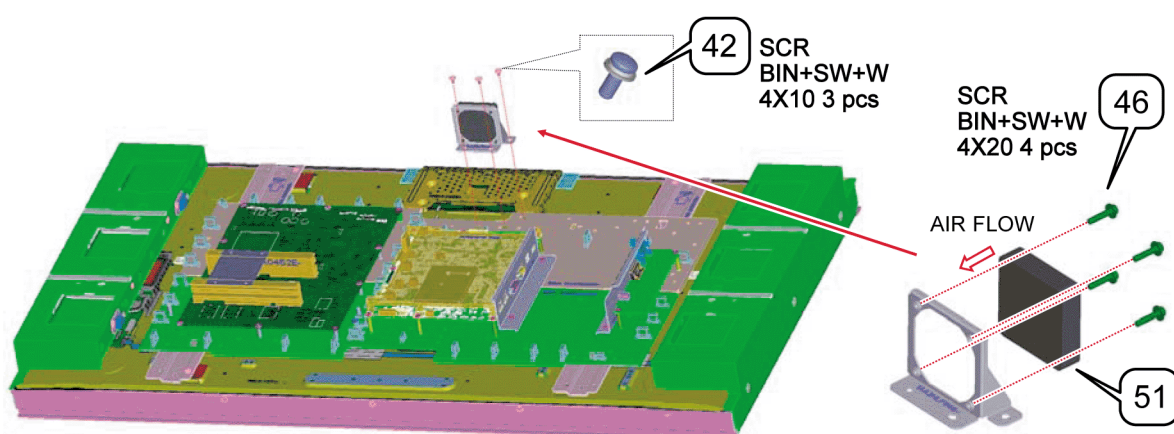
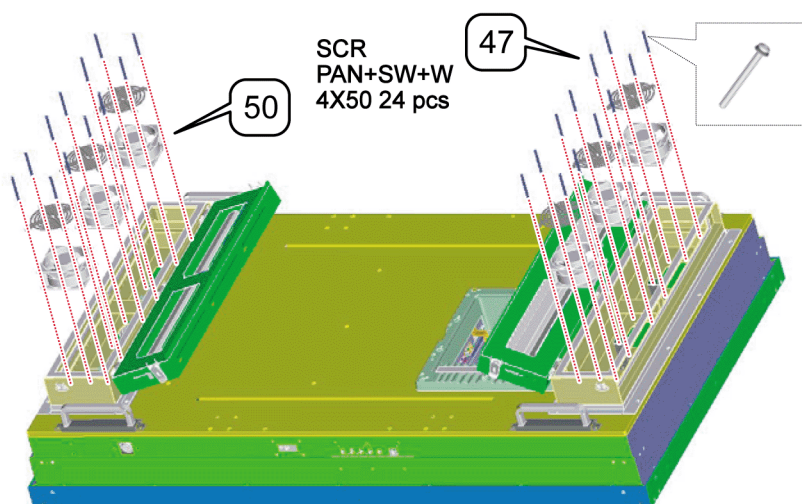
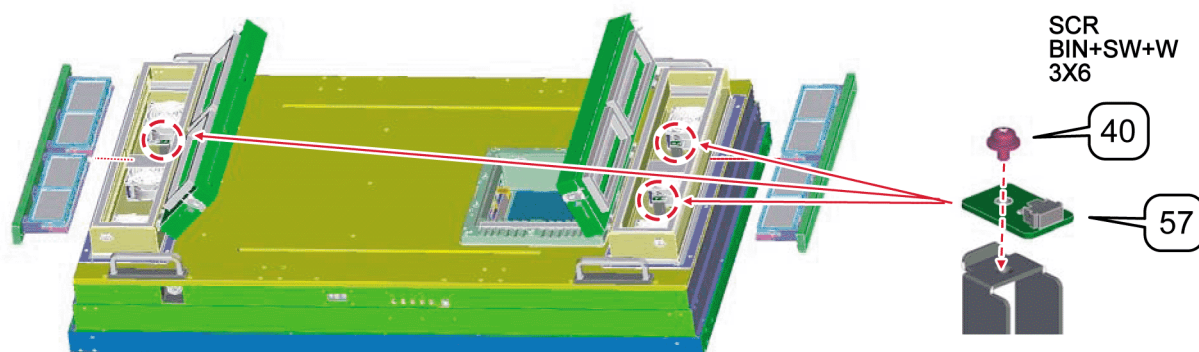
12.1.1.3. Exploded View (3)



12.1.1.4. Exploded View (4)

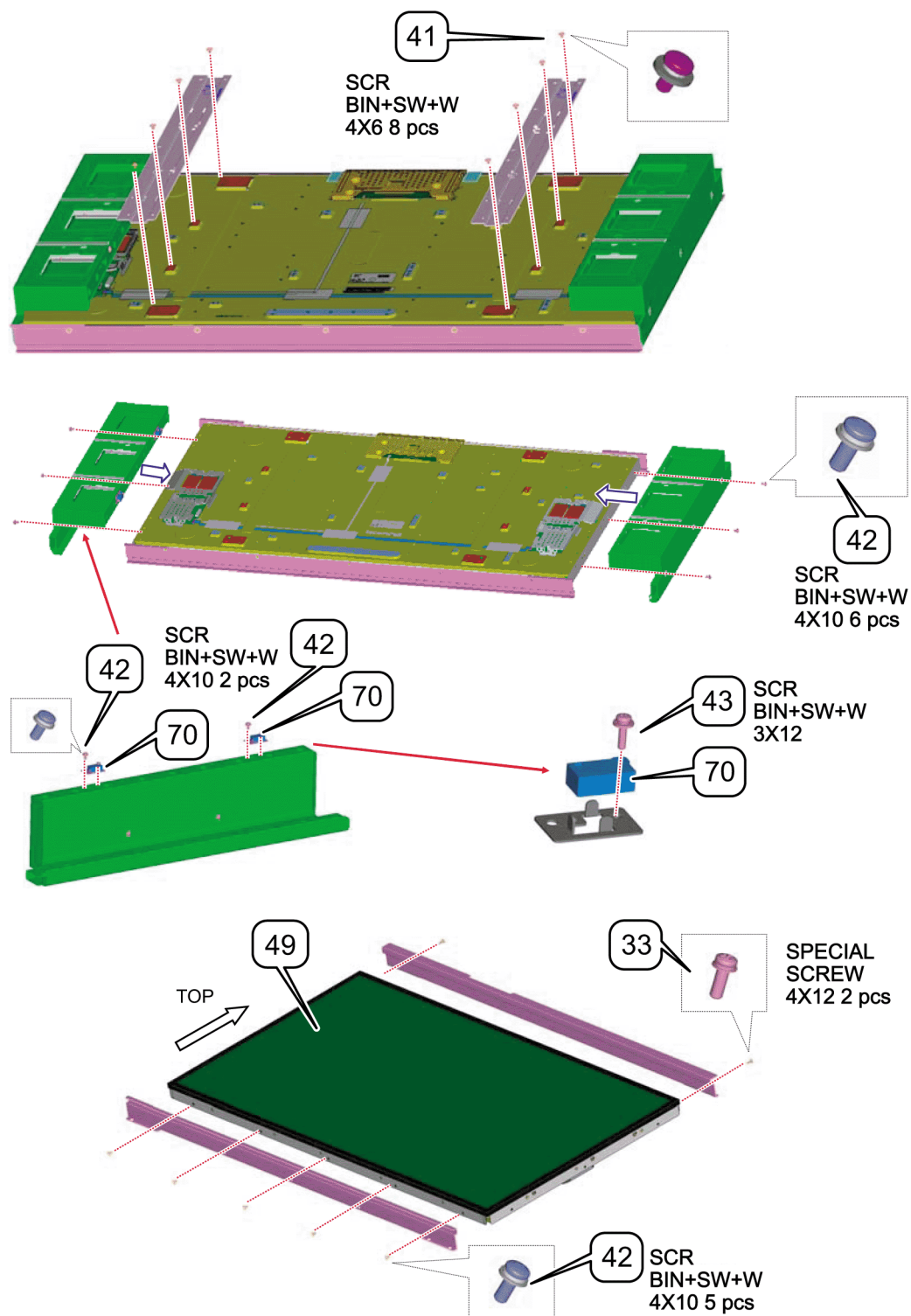


12.1.1.5. Exploded View (5)

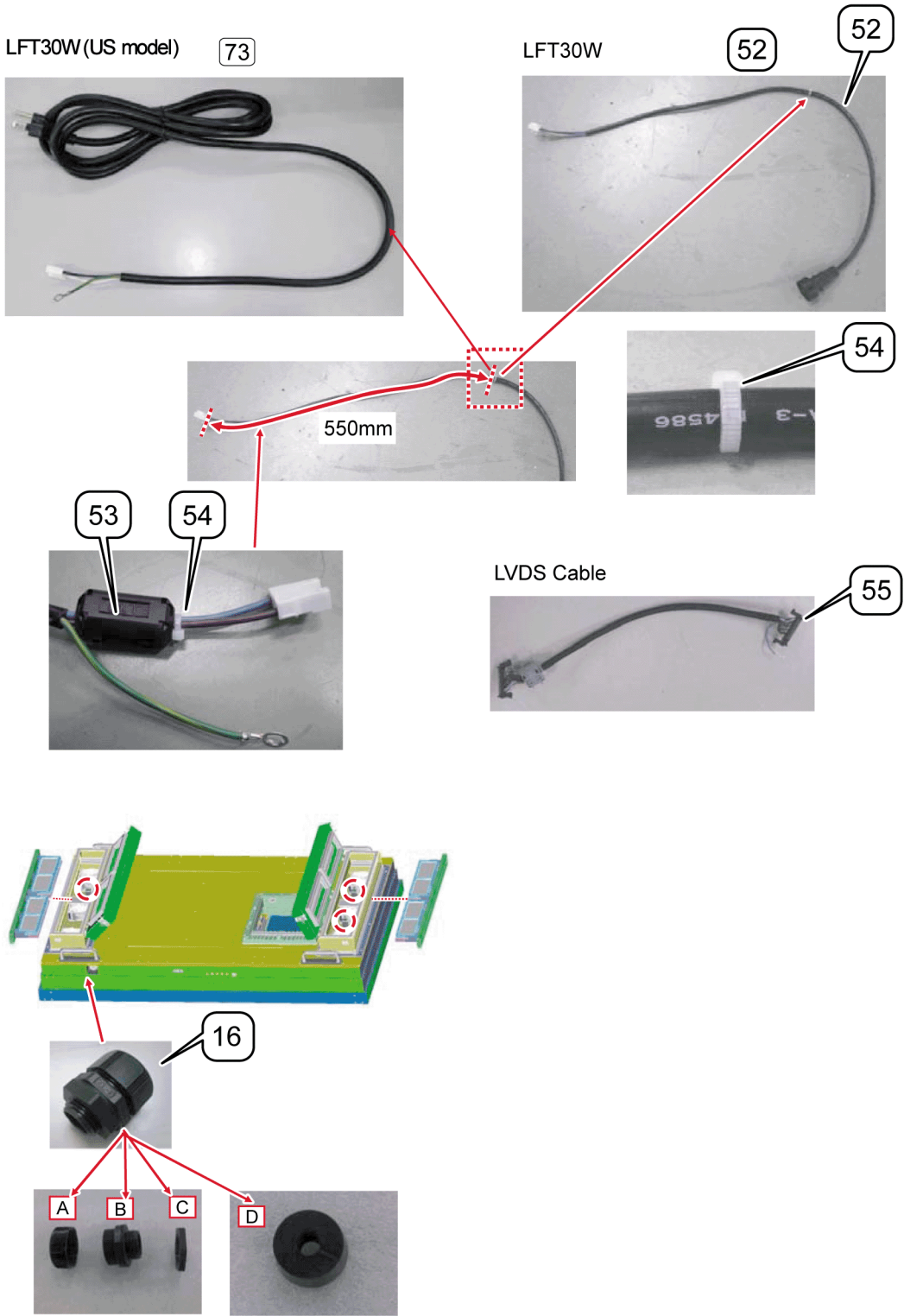




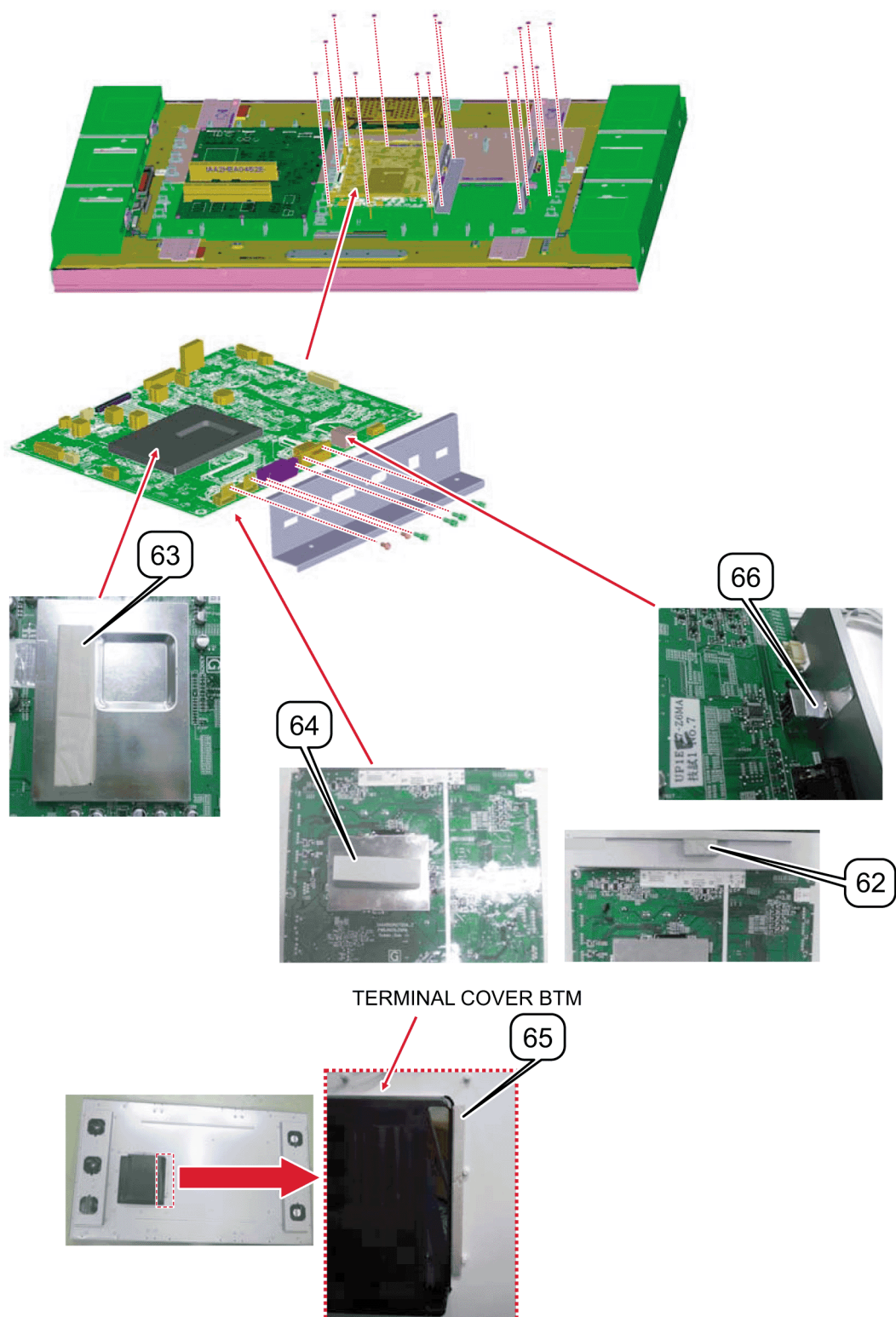
12.1.1.7. Exploded View (7)



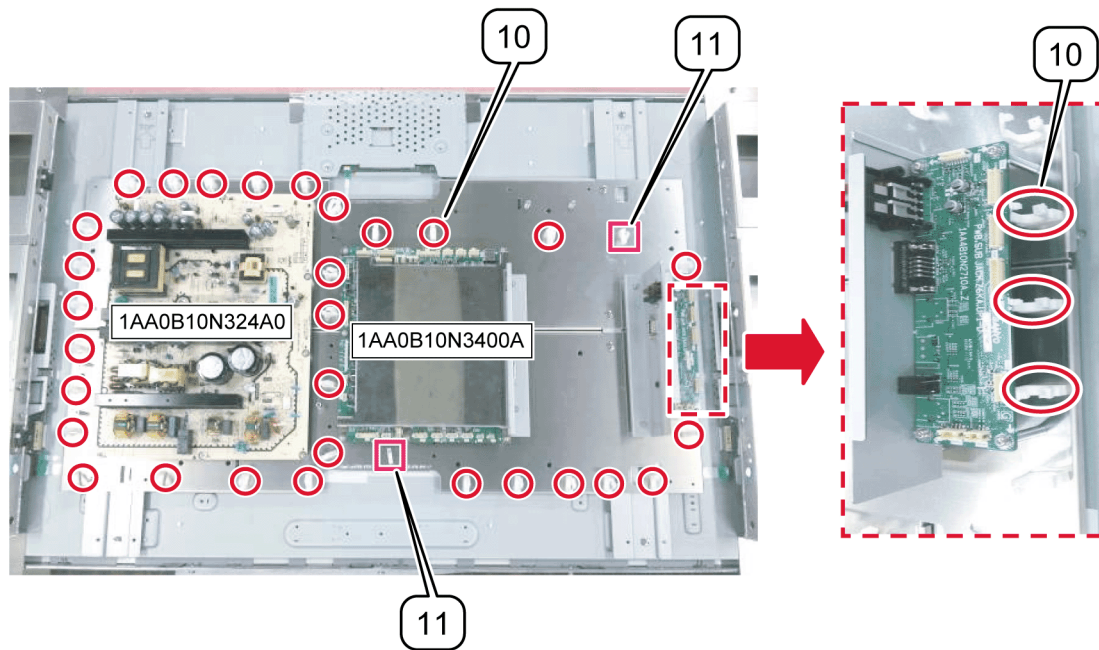
12.1.1.8. Exploded View (8)



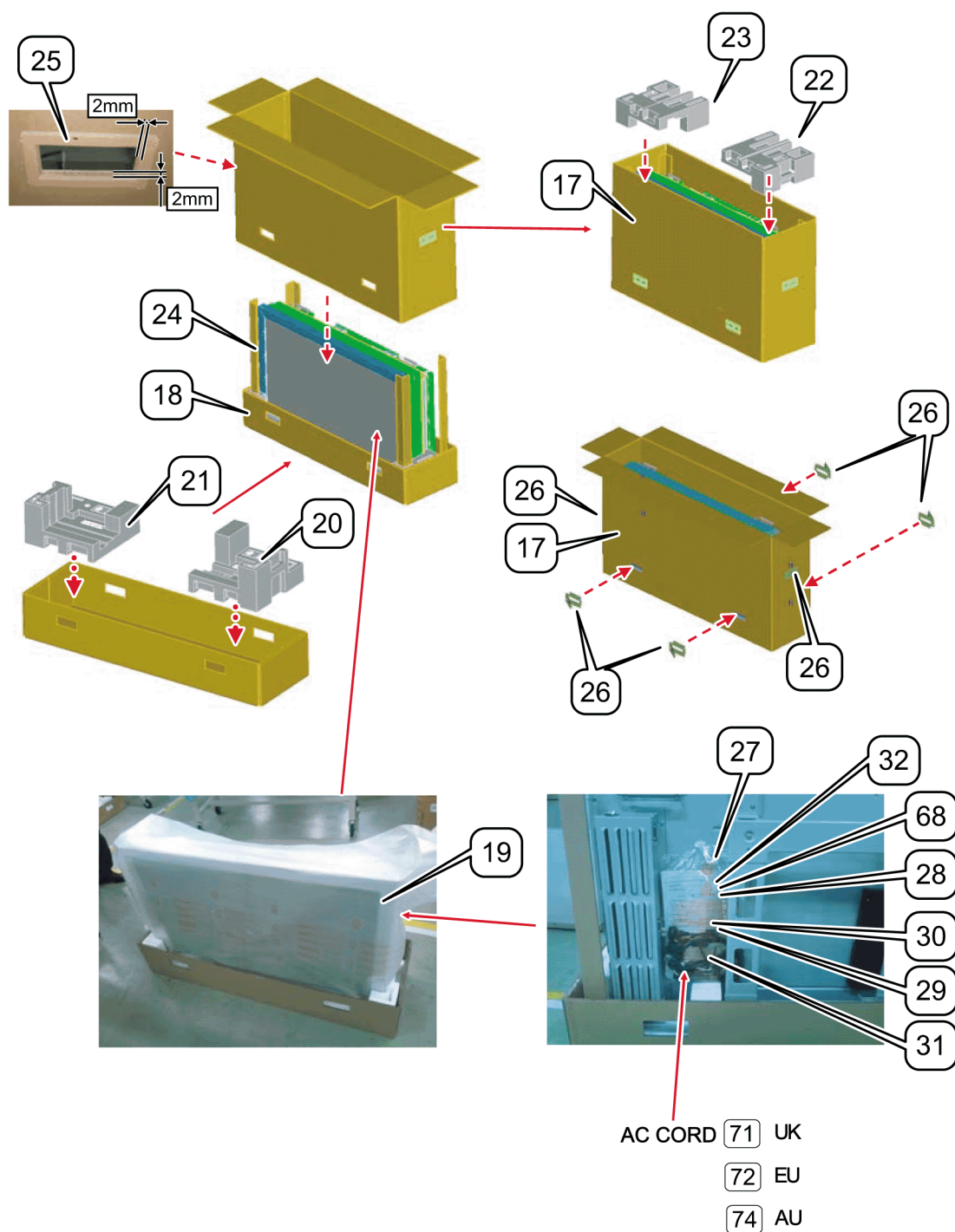
12.1.1.9. Exploded View (9)



12.1.1.10. Exploded View (10)



12.1.1.11. Packing



12.2. Mechanical Replacement Parts List

Note 1: All parts are supplied by PAVCKM.

Note 2: WU, WA or W indicated in Remarks column shows the different parts for each Destination.

WU, WA or W can be confirmed by Manufacturing ID No. indicated in Model Name Plate.

TH-47LFT30WU : North and Latin America

TH-47LFT30WA : Oceania

TH-47LFT30W : Other

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
△	1	T6103593890	CABINET FRONT ASSY	1	
△	2	T6103571119	GASKET FRONT BACK	1	
	3	T6103569420	PANASONIC BADGE LOGO SHEET	1	
△	4	T6103593906	CABINET BACK ASSY	1	
△	5	T6103563381	CONTROL BUTTONS	1	
△	6	T6103593913	FILTER ASSY IN	2	
△	7	T6103593920	FILTER ASSY OUT	2	
△	8	T6103593937	COVER FILTER ASSY	2	
△	9	T6103571126	REAR PLATE RUBBER	1	
	10	T6451044587	FIXER CLAMP	34	
	11	T6451044594	FIXER CLAMP	2	
△	12	T6103593944	AV COVER ASSY (BOTTOM)	1	
△	13	T6103593951	AV COVER ASSY (TOP)	1	
	14	T6103574622	MTG FRAME	2	
	15	T6103462806	ALUMINIUM HANDLE	4	
△	16	T6451051998	FIXER CLAMP	1	
	17	T6103576664	CARTON BOX (TOP)	1	
	18	T6103570976	CARTON BOX (BOTTOM)	1	
	19	T6103577500	JIFFY BAG	1	
	20	T6103570983	CUSHION BTM R	1	
	21	T6103571003	CUSHION BTM L	1	
	22	T6103571027	CUSHION TOP R	1	
	23	T6103571041	CUSHION TOP L	1	
	24	T6103576299	REINFORCEMENT	4	
	25	T6103588957	REINFORCEMENT, HANDLE	2	
	26	T6550022240	SEALING JOINT	6	
	27	T6103577395	POLY BAG (MANUAL)	1	
	28	T6103575223	CD-ROM, DRIVER SOFT	1	
	29	T6103576428	SETUP GUIDE (GERMAN)	1	
	29	T6103576435	SETUP GUIDE (DUTCH)	1	
	29	T6103576442	SETUP GUIDE (ITALIAN)	1	
	29	T6103576459	SETUP GUIDE (FRENCH)	1	
	29	T6103576466	SETUP GUIDE (SPANISH)	1	
	29	T6103576473	SETUP GUIDE (SWEDISH)	1	
	29	T6103576480	SETUP GUIDE (DANISH)	1	
	29	T6103576497	SETUP GUIDE (ENGLISH)	1	
	29	T6103576503	SETUP GUIDE (ARABIC)	1	
	29	T6103576510	SETUP GUIDE (RUSSIAN)	1	
	29	T6103576527	SETUP GUIDE (UKRAINIAN)	1	

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
	29	T6103576534	SETUP GUIDE (KAZAKHSTAN)	1	
	29	T6103576541	SETUP GUIDE (NORWEGIAN)	1	
	29	T6103576558	SETUP GUIDE (FINNISH)	1	
	30	T6103593470	TOUCH PANEL MANUAL	1	
	31	T9450636937	USB CABLE (Included Accessory)	1	Display to PC
	32	N2QAYB000535	REMOTE CONTROL	1	
	33	T4120808003	SPECIAL SCREW	55	
	34	T4120808102	SPECIAL SCREW	32	
△	35	T4120808409	SPECIAL WASHER	11	
	36	T4120808201	SPECIAL SCREW	12	
	37	T4120809307	SPECIAL SCREW	24	
	38	T4120810402	SPECIAL SCREW	36	
	39	T3120730406	SPECIAL SCREW	6	
	40	T4112222107	SCREW (3X6)	40	
	41	T4110303808	SCREW (4X6)	8	
	42	T4112222206	SCREW (4X10)	65	
	43	T4112222602	SCREW (3X12)	2	
	44	T4112223609	SCREW (3X8)	2	
	45	T4110421304	SCREW (3X8)	2	
	46	T4112226204	SCREW (4X20)	4	
	47	T4111577604	SCREW (4X50)	24	
△	49	T6451054470	LCD PANEL	1	
△	50	T6451042880	MOTOR, FAN 11.3W	6	FN901 - FN906
△	51	T6451052018	MOTOR, FAN 1.44W	1	FN907
△	52	T6520036949	POWER CORD-811MM (Inside a set)	1	W/WA
	53	T9520015495	CORE, CLAMP	1	
	54	T6450045387	FIXER CABLE TIES, L100	5	
	55	T6520036833	LVDS CABLE (WLVP - PL)	1	(51P - 51P) Chap. 11.2-6
	62	T6103341279	GASKET	1	
	63	T6103582443	GASKET	1	
	64	T6103582467	GASKET	1	
	65	T6103589282	GASKET EMC	1	
	66	T6103594019	T-ALUMINUM FOIL*AL-36FR 25X10	1	
	68	T6103576411	CD-ROM, OWNERS MANUAL	1	
△	70	T6451034106	WIND VELOCITY SENSOR UNIT	2	
△	71	T6520036994	POWER CORD-2110MM (UK Type)	1	W
△	72	T6520036987	POWER CORD-2600MM (EU Type)	1	W
△	73	T6103593418	POWER CORD-3.0MK (US model only)	1	WU
△	74	T6520036963	POWER CORD-2586MM (AUS Type)	1	WA
		T6103576671	STANDARD WIRE ASSY (K6B-K16B)	1	Chap. 11.2-28

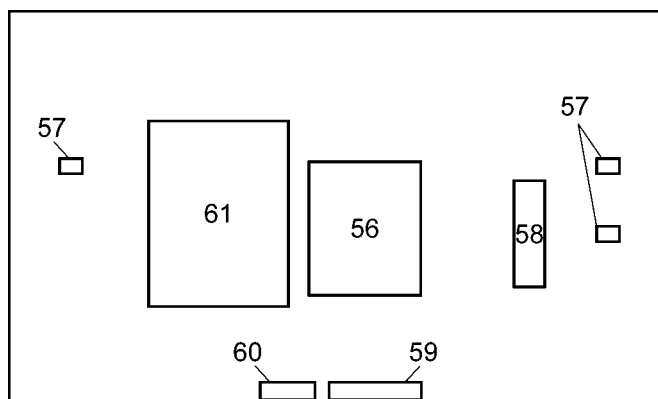
Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
		T6103576688	STANDARD WIRE ASSY (K6C-K16C)	1	Chap. 11.2-26
		T6103576695	STANDARD WIRE ASSY (K8A-K18A)	1	Chap. 11.2-27
		T6103576701	STANDARD WIRE ASSY (K6A-K16A)	1	Chap. 11.2-25
		T6103576718	STANDARD WIRE ASSY (KIV2-CN01)	1	Chap. 11.2-23
		T6103576725	STANDARD WIRE ASSY (KWIND1, KWIND2-WIND VELOCITY SENSOR)	2	Chap. 11.2-12, 13
		T6103576732	STANDARD WIRE ASSY (K8F-K19F)	1	Chap. 11.2-20
		T6103576749	STANDARD WIRE ASSY (K19H-K39H)	1	Chap. 11.2-7
		T6103576756	STANDARD WIRE ASSY (K19G-K39G)	1	Chap. 11.2-7
		T6103576763	STANDARD WIRE ASSY (K72D-K10D)	1	Chap. 11.2-21
		T6103576770	STANDARD WIRE ASSY (K72E-K10E)	1	Chap. 11.2-22
		T6103576787	STANDARD WIRE ASSY (K001R-KSPR)	1	Chap. 11.2-11
		T6103576824	STANDARD WIRE ASSY (K001L-KSPL)	1	Chap. 11.2-11
		T6103576831	NON STANDARD WIRE ASSY (KIV1-CN1)	1	Chap. 11.2-24
		T6103576848	NON STANDARD WIRE ASSY (KFN5, KFN6, KFN7)	3	Chap. 11.2-17, 18, 19
		T6103576855	NON STANDARD WIRE ASSY (KFN2, KFN3, KFN4)	3	Chap. 11.2-14, 15, 16
		T6103576862	NON STANDARD WIRE ASSY (TEMPERATURE SENSOR)	3	Chap. 11.2-1, 2, 3
		T6103576886	NON STANDARD WIRE ASSY (KTH1, KTH4)	2	Chap. 11.2-8, 10
		T6103576893	NON STANDARD WIRE ASSY (KTH3)	1	Chap. 11.2-9
		T6103591636	LABEL CARTON	1	W
		T6103591643	LABEL CARTON	1	WU
		T6103591650	LABEL CARTON	1	WA
	75	T6451044808	SCREW	2	
		T6520036826	USB CABLE (TOUCH PANEL CONTROL - MAIN KUSB2)	1	Chap. 11.2-4

12.3. Electrical Replacement Boards list

Note: All boards are Non serviceable.

Safety	Ref. No.	Part No.	Part Name & Description	Pcs	Remarks
⚠	56	T6103568546	CIRCUIT BOARD (MAIN)	1	
⚠	58	T6103569628	CIRCUIT BOARD (JACK)	1	
⚠	59	T6103569635	CIRCUIT BOARD (KEY SW)	1	
⚠	60	T6103569659	CIRCUIT BOARD (RC+LED)	1	
⚠	57	T6103570396	CIRCUIT BOARD (TEMPERATURE SENSOR)	3	
⚠	61	T6103570440	CIRCUIT BOARD (POWER)	1	

12.4. Boards Layout



※59, 60 is attached to the Cabinet back.

Ref.No.	Board Name	Function	Remarks
56	MAIN	Main, Audio & Video Signal Processor, HDMI in, DVI in, PC in	All boards are Non serviceable.
57	TEMPERATURE SENSOR	Temperature Sensor	
58	JACK	AV Terminal	
59	KEY SW	Control Button	
60	RC+LED	Remote Receiver, LED	
61	POWER	Power (AC/DC), DC-DC	